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MEASUREMENT AND ANALYSIS OF ROCK DEFORMATION AND SUPPORT SYSTEM RESPONSE IN THE DRILL AND BLAST AND BORED ACCESS DRIVAGES AT THE DONKIN-MORIEN PROJECT (UP-G198)

VOLUME I - DATA REPORT

prepared by

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

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Canada

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REPORT TO
CANMET

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VOLUME I - DATA REPORT

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VOLUME II - ANALYSIS OF DATA
VOLUME III - APPENDICES A AND B
VOLUME IV - APPENDICES C, D AND E

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FOREWORD

In the late 1970's the Cape Breton Development Corporation delineated a significant submarine coal resource off Cape Perce on Cape Breton Island. Following a comprehensive Project Definition Study, site work commenced at the Donkin-Morien Development Project in 1980. This Project called for four cross measure access tunnels with a total length of 15.6 km and a free cross sectional area of 30 m^2. A number of tunnel drivage methods, including drill and blast, roadheader and full face tunnel boring machine were considered.

In December 1981 Beaver Underground Structures Ltd. of Montreal began to excavate the first tunnel at Donkin-Morien. This tunnel (7.6 m wide by 5.3 m high with a uniradial arched back) was driven by conventional drill and blast techniques to a chainage of 1027 m at which point the drivage was stopped.

In the winter of 1981/82 demonstration of an experimental tunnel boring machine took place in the second tunnel at the Donkin-Morien project. This experimental unit was a 4 m diameter earth tunneling machine modified to carry a rock-cutting head. The success of this demonstration lead to a decision to construct a prototype 7.6 m diameter machine to drive the required cross measure tunnels to access the coal resouce block.

In March 1982 the Source Development Fund of Supply and Services Canada jointly with the National Research Council, Cape Breton Development Corporation and Energy, Mines and Resources Canada awarded a contract to Lovat Tunnel Equipment Inc. of Toronto to construct and deliver a prototype 7.6 m diameter full face rock tunnel boring machine for use at Donkin-Morien. In October 1983 this prototype was assembled at Donkin-Morien and in January 1984 the machine and trailing package were fully installed at chainage 227 m in the second tunnel.

The two different methods used to drive two parallel tunnels in identical strata provided a unique opportunity to compare rock/support interactions on a "head-to-head" basis. This was recognized by the geotechnical consultants to the project who submitted an Unsolicited Proposal to perform the following studies:

- Comparison of the response of rock around the tunnels due to the two different drivage methods.
- Definition of the rock/support interaction in the tunnel boring machine drivage.
- Determination of the "in-situ" stress conditions at the tunnel boring demonstration site to define their effects on the rock response.
- Assessment of the thrust transfer characteristics between the tunnel boring machine and the tunnel support system.

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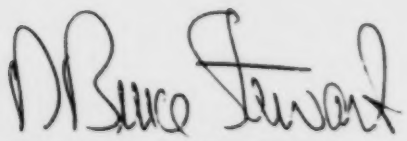
This proposal was supported by the Canada Centre for Mineral and Energy Technology. In early 1983 Supply and Services Canada awarded a contract to Golder Associates to undertake this joint geotechnical research programme with CANMET and the Cape Breton Development Corporation.

This final report of the investigation is a comprehensive data summary of the programme complete with routine geotechnical and tunnel data. It is hoped that the data will be used by other researchers to refine and extend these results by a variety of mathematical techniques and approaches.

The quality and calibre of the work is testimony to the perseverance and abilities of Golder Associates staff and the excellent cooperation and assistance provided by all participants in this project. The work program and results benefited from discussions with a Technical Review Committee that included Dr. R.P. Benson of Klohn Leonoff, Mr. A. Stewart of D.R. Piteau and Associates, Mr. G.E. Larocque and Mr. D.B. Gladwin of CANMET - under the chairmanship of the undersigned.



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ABSTRACT

In connection with the initial phase of the Donkin-Morien Development Project, a tunnel research program was undertaken to study the rock deformation and support system response in the drill and blast and TBM access drivages. The research study included an extensive field instrumentation and testing program and the preliminary analysis of the data obtained. Because of the overall project schedule only the TBM excavation was undertaken during the period of the field program. Hence, the data collected are primarily related to the performance of the TBM drivage.

The in situ field testing included stress measurements by overcoring, borehole modulus testing and hammer seismic surveys of the tunnel sidewalls. The field instrumentation comprised displacement monitoring around the tunnel including a "mine-by" test, and measurement of axial stresses, radial stresses, and strains in the ring beam supporting the TBM excavation. Laboratory testing was also carried out to study the mechanical, chemical and mineralogical properties of the rock.

The deformation moduli determined by various laboratory and field methods were compared to assess the damage induced by different excavation methods. The displacements around the tunnel were analysed to determine the rock loading on the support system. A simplified numerical model was used to analyse the rock-support interaction and the results were compared with the measured data. In addition, the thrust loads on the tunnel liner resulting from the TBM advance mechanism was analysed to examine the degree of dissipation of load with distance.

The instruments used for the research program performed satisfactorily in the underground environment and good quality data was obtained. The numerical modelling carried out as part of the data interpretation provides a useful assessment of the performance of the support system.

The research program has contributed significantly to the success of the TBM drivage in providing a basis for modification of the support requirements as the tunnel advanced. In addition, the data on support performance has confirmed the stability of the tunnel and the adequacy of the support design. It is hoped that the results of this study will be of assistance in providing a rationale for the design of future TBM driven tunnels.

RESUME

En rapport avec la phase initiale du Projet de Développement Donkin-Morien, un programme de recherche fut entrepris pour étudier la déformation du massif et la réponse du système de support dans deux tunnels adjacents. L'un fut excavé par forage et sautage alors que le second fut excavé au moyen d'un tunnellier (TBM). Le massif se composait d'une séquence de grès et de dépôts sédimentaires mixtes incluants des lits de charbon. L'étude comprenait un vaste programme d'essais et d'instrumentation et une analyse préliminaire et limitée des données obtenues. A cause du calendrier du programme d'excavation, seul le tunnel avancé au moyen de la TBM fut excavé durant la période du programme d'essais sur le terrain. Conséquemment, les données collectées sont principalement reliées à la performance de ce tunnel. Des données limitées furent obtenues du tunnel excavé par forage et sautage mais elles fournirent tout de même une base raisonnable pour la comparaison des deux techniques d'excavation dans le massif de grès.

Les essais in-situ incluent des mesures de contraintes par la méthode de sur-forage, la détermination du module d'élasticité du massif et des relèvements séismiques. Le programme d'instrumentation comprenait la mesure du déplacement du massif autour du tunnel, incluant un essai dynamique (mine-by test) et la mesure des déformations ainsi que des contraintes axiales et radiales dans les arches supportant le tunnel. Des essais en laboratoire furent aussi entrepris pour étudier les propriétés mécaniques, chimiques et minéralogique du massif.

Les modules de déformation, déterminés par des méthodes in-situ et de laboratoires variées, furent comparés dans le but d'évaluer les dommages induits à la formation de grès par les deux méthodes d'excavation. La déformation du massif autour du périmètre de l'excavation fut aussi analysée pour évaluer le chargement du système de support. Un modèle numérique fut utilisé pour analyser l'interaction entre le massif et les supports et les résultats obtenus furent comparés avec les données mesurées. De plus, le chargement des blocs de poussée, résultant de l'avancement de la TBM, fut analysé pour examiner le degré de dissipation du chargement en fonction de la distance.

De façon générale, les instruments utilisés pour le programme ont bien fonctionnés dans l'environnement souterrain et des données de bonne qualité furent obtenues. Le modèle numérique permet d'obtenir un estimé raisonnable de la performance du système de support.

En résumé, le programme de recherche a contribué d'une façon significative à l'excavation du tunnel au moyen de la TBM, car les données collectées ont été utilisées pour établir les besoins en supports pour le projet. Les données concernant la performance du système de support ont confirmé la stabilité du tunnel. Il est espéré que les resultats de cette étude seront utilisés pour la conception de futurs tunnels.

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I-2 INTRODUCTION

The mine access tunnels for the Donkin-Morien project currently under construction in Cape Breton Island, Nova Scotia comprise two parallel tunnels driven through a sedimentary sequence of sandstone, siltstone and mudstone to intersect the Harbour coal seam approximately 3.5 km offshore. One of the tunnels (tunnel No. 3) was driven by the drill and blast method for a distance of 1027 m with dimensions of 7.6 m width by 5.3 m height (with a uniradial arch) and was stabilized by means of rock bolts and shotcrete. The other tunnel (tunnel No. 2) was driven using a 7.6 m diameter full-face shielded Lovat TBM and was supported by ring beams (steel sets).

Golder Associates was involved in the Donkin-Morien Project as the geotechnical consultant to the Cape Breton Development Corporation for the tunnel drivage. In connection with this project, Golder Associates submitted an unsolicited research proposal for a study of the performance of both tunnelling methods. Subsequently a research contract was awarded to Golder Associates under the auspices of CANMET through Supply and Services Canada. A Technical Review Committee was also established to assist in reviewing the progress of the work and to provide constructive commentary on research directions throughout the course of the project.

The primary objectives of the research program were to compare the performance of the TBM and drill and blast drivages, and to study the thrusting characteristics and rock-support interaction of the TBM excavation. The emphasis of the research contract was on the collection of field data which was to be made available in the form of a comprehensive report for the future use of others who might wish to carry out a detailed interpretation and analysis.

The field program of the research study was also supported by the Cape Breton Development Corporation who provided the following:

- all related drilling services for the program
- manpower assistance as required for instrument installation and monitoring
- geological mapping and core logging services
- tunnelling records and relevant geotechnical data not collected as part of the research program.

The field work for the research program started in May 1983 and was completed in December 1984. This report provides a comprehensive summary of the work undertaken and the results of the research program. The items addressed in the report include the following:-

(a) the scope of the research program;

(b) the geological conditions encountered and details of the tunnel support systems;

(c) the instrumentation and testing programs for various aspects of the study;

(d) data collected from laboratory testing, field instrumentation, and testing; and

(e) limited and preliminary interpretation and analysis of the data.

For ease of reference, this report is divided into four (4) volumes. Volume I contains the data report which addresses items (a) to (d) described above. Volume II includes the limited and preliminary interpretation and analysis of the data. Volumes III and IV comprise the Appendices including the tunnelling records for tunnels Nos. 2 and 3, borehole records, raw data tables and graphs, in situ testing data and results of miscellaneous laboratory tests.

Throughout the report, the prefix to the section number in the text corresponds to the volume number; i.e. Section I-1 is the first section in volume I. Similarly table and figure numbers correspond to the report section number within which the first reference is made i.e. Table I-3.1 is first table referred to in Volume I Section 3.

Every effort has been made to present a comprehensive record of the data so that investigators who are not familiar with the research program or the Donkin-Morien Development Project can conduct analyses of these data.

I-3 SCOPE OF THE RESEARCH PROGRAM

The original scope of the research program was established in September 1982. A number of revisions followed due to changes in the schedule of tunnelling activities, and on the basis of the collected field data and recommendations of the review committee as the research program progressed. The final scope of the research program comprised four (4) major parts.

Part 1 - Measurement of deformation characteristics in the drill-and-blast section of tunnel No. 3

Part 2 - Measurement of deformation and rock/support interaction in the TBM drivage in tunnel No. 2

Part 3 - In situ stress measurements and other specialized testing programs

Part 4 - Preliminary and limited interpretation and analysis of the field data.

The research activities included in each part of the program are summarized in Table I-3.1.

I-4 GEOLOGICAL CONDITIONS

I-4.1 Geological Data

The Donkin-Morien access tunnels were driven northwards, from portals on Cape Perce, through northerly dipping coal measure rocks of Carboniferous age, to intersect the coal reserves of the Harbour Seam about 3.5 kilometers offshore at a depth of approximately 200 m below seabed.

The geological data available prior to the tunnel drivages included:

- Onshore boreholes
- Shoreline mapping
- Offshore boreholes (about 4 km offshore and drilled to the Emery Seam)
- Seaborne shallow and deep penetration seismic surveys

These data was summarized in the geotechnical report prepared for the tunnel drivage contract and formed the basis for predicting the geology along the tunnels. The procedure for the geological prediction is summarized below.

- The geophysically defined offshore dip angles were calibrated using surveys of old coal workings adjacent to, but several kilometers west of the tunnel alignments. Seismic velocities were adjusted so that the interpreted bed boundaries matched the surveyed dip information.

- Correlation of the coal seam seabed outcrops were correlated with seabed depressions considered to have developed in the course of shoreline erosion since glacial ice sheet recession.

- Borehole records from holes drilled from within the first 1000 m of tunnel No. 3 were used to provide an accurate correlation of near-tunnel stratigraphy over this portion of the tunnel drivage.

- Borehole intersections with the coal seams within the first 1000 m of tunnel No. 3 were fitted by the least squares method and a projection of the stratum elevation at the end of the tunnel was made. As additional information was collected a plot of projected elevation versus data base length was maintained. This plot asymptotically approached the correct value.

To check on the location of the major coal seams and the nature of the intervening strata, and to comply with Labour Canada Coal Mining Regulations, N-size strata control holes ranging from 30 to 50 m in length were drilled at 200 to 300 m intervals along both tunnels. These holes were drilled either vertically upwards or forward at 35° to the horizontal. In tunnel No. 3 the holes were drilled with a skid mounted Longyear 38 drill rig modified for use in coal mines. In tunnel No. 2, the holes were drilled with a modified Longyear 38 drill which was powered by the TBM hydraulics and was mounted behind the TBM shield. The records of the boreholes drilled as part of the research program (i.e. those drilled for instrument installation and testing) are included in Appendix B.

The borehole data provided a check on the previously predicted geology. Over the 3579.78 m of tunnel drivage in tunnel No. 2, the encountered geology agreed closely with the geological prediction. Figure I-4.1 presents the "as intersected geology" along tunnel No. 2.

I-4.2 Geological Conditions at Instrumentation Stations

The geological conditions encountered along the tunnel (based on the geological data from drilling and tunnel mapping) at the instrumentation stations are summarized and presented on Figures I-4.2 to I-4.15. The locations of the full instrumentation arrays and the extensometers (projected on the longitudinal sections) are shown on the figures. The positions of the extensometer anchors are marked on the figures and shown in Table I-6.1 which summarizes the details of all instrumentation arrays.

I-5 TUNNEL LAYOUT AND SUPPORT SYSTEMS

Tunnel Nos. 2 and 3 are two of the four parallel tunnels to be constructed for the Donkin-Morien Project. The layout and gradients of the tunnels are shown on Figure I-5.1. The excavation methods and the tunnel support systems for the tunnels are described in the following sections.

I-5.1 Tunnel No. 3

Tunnel No. 3 was commenced in January 1982 and has been driven through the "Portal" sandstone for a distance of 1027 m. The drivage contract was carried out by Beaver Underground Structures Ltd. and completed in February 1983, shortly before the commencement of the field program for this study. The tunnel was excavated full face in 3 to 3.5 m rounds by drill and blast techniques to dimensions of 7.6 m width by 5.3 m height(with a uniradial arch) as shown on Figure I-5.2. Typical blasting patterns and the extent of overbreak are presented in Appendix B. Figure I-5.3 shows the excavated profile of tunnel No. 3. This tunnel will be extended in future using the full-face, 7.6 m diameter TBM.

The support system for the tunnel comprised rock bolts at 1.5 m centres and 50 mm (minimum) thick shotcrete applied by dry mix process. Shotcrete was generally applied close to the face after rock bolting. Occasionally the shotcrete was reinforced with 150 mm x 150 mm x 4 mm wire mesh in isolated areas where lenses of weak mudstone were encountered. The rock bolts consisted of 3.5 m long, 25 mm diameter high yield deformed bars (yield strength 200 kN) installed with fast and slow resins and pretensioned to 12 tonnes.

Primary anchorage of the rockbolts was achieved by placing three to four fast setting cartridges at the base of the hole. The remainder of the hole was filled with slow setting cartridges and the bolts were spun into position. Pretensioning was carried out after setting of the fast resin and prior to setting of the slow resin.

I-5.2 Tunnel No. 2.

The validity of the concept of using a TBM for tunnel drivage for the Donkin-Morien Development Project was verified in 1982 by driving an experimental (4 m dia. soft ground Lovat TBM equipped with a rock cutter head) TBM for a distance of 200 m in tunnel No. 2. The experimental program was undertaken by Beaver Underground Structures Ltd. under a contract with the Department of Supply and Services.

The TBM used to drive Tunnel No. 2 is a 7.6 m diameter full face, shielded LOVAT TBM. The machine is propelled by a series of hydraulic jacks (200 mm diameter) pushing off ring beams installed at the tail of the machine. The basic configuration of the TBM and the machine propulsion method are shown on Figure I-5.4 (Hunter and Lovat, 1984). A photograph showing the general layout of the tunnel and support system is given on Figure I-5.5.

The TBM was installed in a shaft excavated behind (on the in-bye side of) the portal of Tunnel No. 2. Installation began in August 1983 and by late December 1983 the machine had progressed 220 m at which point the TBM and its trailing packages were completely installed. Excavation of the tunnel from chainage 220 m commenced in early January 1984 and was completed in December 1984 at a final chainage of 3579.78 m.

The tunnel support system comprised a system of ring beams and thrust blocks (it should be noted that the terms "steel sets" and "ring beams" are used interchangeably in this report). The ring beams were in general spaced at 1.5 m centres along the length of the tunnel.

From the rock support design point of view, ring beams were not required in the "Portal" sandstone (Type I) and in the relatively more competent strata such as interbedded sandstone/siltstone (Type II) and relatively more thickly bedded siltstone (Type III) units. However the propulsion method of the LOVAT TBM required the ring beams and thrust blocks to sustain the thrust load from the TBM during tunnel advance. Hence ring beams were used throughout the tunnel.

In areas where major coal seams came within 2.5 m above the tunnel crown, the support spacing was reduced to 1 m to provide extra support. A list of the areas where 1 m spacing was used is presented below:

Chainage (m)	Reason	Thickness of Coal Seam (m)	Chainage* at which Seam Intersected Tunnel (m)
1630 - 1634	TBM stuck	-	-
1675 - 1754	Emery seam	1.8	1735.4
2263 - 2282	Phalen seam	1.5	2274.6
3466 - 3499	Harbour seam	3.41	3478.3

* Intersection of base of seam with crown line of tunnel.

One complete ring beam was made up of six identical steel set segments, each of which comprised a W150 x 23 (150 mm x 150 mm x 23 Kg/m) wide flange beam. The complete ring beam was assembled within the shield and subsequently expanded against the excavated rock surface by means of a "rib expander".

To allow for the expansion of the ring beams spacer blocks were designed to be used at the two butt joints in the crown segment (see Figure I-5.2). During the tunnel drivage, there were several modifications to the components of these joints by others. The details of these modifications and the locations where they were used and their performances are summarized in Table I-5.1.

Wire mesh panels (1.7 m long x 0.8 m wide) fabricated from 8 mm (longitudinal) and 4 mm (cross) wires were installed over and between the ring beams (above the springline) to provide support to any loosened rock fragments and hence to improve safety during tunnel drivage. In areas where substantial spalling occurred, steel channel laggings were placed between the steel sets to prevent excessive sagging of the wire mesh panels.

The thrust of the TBM was sustained by 24 thrust blocks uniformly spaced along the circumference of the steel set as shown on Figure I-5.2. The thrust blocks were fabricated from hollow structural steel sections (HSS 101.6 x 101.6 x 7.93 class C) with end plates to facilitate their connections to the steel sets. The allowable working load of the thrust block in compression was 540 kN.

Due to the configuration of the ring beam system and the thrusting characteristics of the TBM, the structural stability of the ring beam itself depended on the effectiveness of ring beam expansion and to some extent, on the distribution of TBM thrust load on the support system. In three incidents (ch. 247, 1587, and 1996) where the ring beams were not expanded tight against the rock (due to inadequate ring beam expansion) and/or where the drivage alignment was over-compensated within a short distance, rotation of the ring beams occurred behind the shield. Between chainages 250 and 2700 m, arrays of 1 m long 25 mm diameter steel dowels (6 to 11 dowels per arrays) were installed at approximately 10-50 m

spacing along the tunnel on the outbye side of the ring beam to provide reaction to the TBM thrusts. The thrust blocks were also strapped at selected locations with short steel dowels to enhance the stability of the ring beams themselves.

I.5.3 Tunnelling Records

To provide a comprehensive reference of the tunnelling activities during the drivage of tunnels No. 2 and 3, two sets of summary daily reports were compiled from the inspector's shift reports available from the Cape Breton Development Corporation. The first set comprised the summary daily reports for tunnel No. 2 (see Appendix A-1) covering the period from January to December, 1984. The second set consisted of the summary daily reports for tunnel No. 3 (see Appendix A-2) during the periods before and after the instrumented sections were excavated. These also apply to stations where in situ measurements or testing were undertaken. Typical blasting patterns used in areas close to the instrumented sections are presented in Appendix A-3, Figures A.1 to A.10.

I-6 INSTRUMENTATION AND TESTING PROGRAM

The scope of the research program has been presented in Section I-3 of this report. The instrumentation and testing program for the project was scheduled based on the anticipated geological conditions. Instrument installations were not always possible at the desired chainages because these activities had to be scheduled during periods of maintenance or conveyor drive installation in order to minimize disruption to the tunnel advance.

Figure I-5.1 shows the layout of all instrumentation arrays and includes sections showing locations of the instruments installed. The figure also includes details of the specialized field testing such as in situ stress measurements, borehole modulus testing and hammer seismic surveys on tunnel walls. The types of instrumentation included in each array, instrument reference number, extensometer anchor depths and, date of instrument installation are summarized in Table I-6.1. The details of the instruments, the installation and testing procedures, and the problems encountered in each aspect of the program are outlined below.

I-6.1 In situ Stress Determination

A program of in situ stress determination was completed in May 1983 and a separate report on the results of the measurements is included in Appendix B-2.

The in situ stress measurement program was undertaken in a 100 mm diameter borehole located at chainage 964 m in tunnel No. 3. The hole was drilled into the east wall of the tunnel and the in situ stresses were measured by the method of overcoring using the CSIRO (Australian Council of Scientific and Industrial Research Organization) hollow

inclusion gauge and the USBM (United States Bureau of Mines) deformation gauge. The depths of stress measurements are given on Figure I-6.1. The CSIRO gauge enables the determination of the three-dimensional stress field whereas the USBM gauge provides the stresses on a plane normal to the axis of the borehole.

Continuous monitoring of the output signals from the gauges was available during the overcoring tests. The deformation modulus of the rock at the test position was determined by testing the overcored rock specimen using a "biaxial test cell".

The stress measurement borehole was drilled using a Longyear 38 underground drill supplied by the Cape Breton Development Corporation. Apart from standard HQ drilling equipment used for the 100 mm dia. (H sized) hole, specialized drilling equipment compatible with the wireline system was developed and used to facilitate the drilling of the pilot hole and the overcoring operation.

In compliance with the statutory requirements of the Coal Mines (CBDC) Safety Regulations, all electrical equipment used for the stress measurement program was inspected and certified by the Canadian Explosives Atmosphere Laboratory of CANMET.

I-6.2 Measurement of Rock Displacements

I-6.2.1 Instruments Used for Monitoring Rock Displacements

Irad Gage rigid and flexible sonic probe multiple point borehole extensometers, (MPBX's) were used to measure rock displacements. The essential features of these extensometers are summarized in Table I-6.2. The general procedures for installation are outlined below:

Rigid Sonic Probe Extensometers

The rigid sonic probe extensometers were installed in either B-size (60 mm dia., generally for 3 anchors excluding the head assembly) or N-size (75 mm dia. 4 anchors) holes using C-clip anchors. After completion of drilling the hole was flushed clean and the size of the hole checked using the "test gauges" supplied by IRAD Gage. This check was made to ascertain the appropriate size of C-clip for the hole.

Each extensometer comprised a series of 6 mm (0.25 in) diameter stainless steel rods attached to C-clip anchors (spring loaded circlips retained in PVC plugs slightly smaller in diameter than the inside of the boreholes). The deepest anchor for each installation was pushed into position by means of the attached rod and the circlip released to spring against the borehole wall thereby fastening the C-clip anchor in position. Shallower anchors were similarly installed, sliding the rods(s) already in place through loosely fitting holes in subsequent anchor plugs. Each extensometer rod contained a magnet located near the collar of the borehole arranged so that the depth to each rod magnet varied. The head assembly which consists of individual sleeves for each rod and a central guide tube which holds the sonic probe sensor was then slipped in place and retained with circlips. In long installations, additional rod supports were fitted between the anchors to prevent sag of the extensometer rods.

The sonic probe sensor reads the distance between a reference magnet housed in the head assembly and those on the extensometer rods described above. The recorded measurements indicate the relative distances (read out in inches) between the head assembly and the anchor. Figure I-6.2 shows the head assembly of the rigid sonic probe extensometer.

Flexible Sonic Probe Extensometers

The flexible sonic probe extensometers were installed in 38 mm dia. holes. These holes could be drilled more economically and much faster than the B and N size holes.

Flexible sonic probe extensometers differ from the rigid version in having a full length sensor probe. This permits the magnets to be mounted in the C-clip anchors themsleves rather than on extensometer rod which carry the magnets near the collar of the borehole. The maximum probe length and hence maximum depth of measuring for this type of installation is 7.6 m but it is relatively simple to install large numbers of measurement points.

Once the hole was drilled it was flushed clean and the installation proceeded by installing a C-clip anchor (deepest anchor) which was pushed up the hole with the installation rods. When the anchor was at the desired position the pin was released thereby setting it in position. This procedure was repeated for the remaining anchors. In this study, a total of up to ten (10) anchors were installed in one extensometer hole. The spacing of the anchors could be as close as 75 mm but as discussed above the maximum depth of installation is currently limited to 7.6 m which is the maximum length of the available flexible sonic probe.

After the anchors were installed a central PVC tube was installed through the anchors over the complete length of the hole (maximum 7.6 m). This tube was used as a guide for the insertion of the flexible sonic probe. Readings were taken by inserting the probe past all the anchors. The distances between the head anchor and subsequent anchors were read (in inches on the readout) by switching to appropriate anchor reference numbers on the readout unit. Figure I-6.3 shows the flexible sonic probe and the layout of the anchors and central guide tube.

I-6.2.2 Extensometer installation in Tunnel No. 2

In tunnel No. 2, on-going TBM drivage activities necessitated the installation of the MPBX's during weekend or maintenance periods in order to minimize disruption to the tunnelling progress. Wherever possible, the extensometers were installed at the face from within the TBM head in order to maximize the information on rock displacement. Extensometers at the invert were installed behind the shield as the machine components and the configuration of the cutter head precluded the drilling of any downhole within the shield. Excellent co-operation from CBDC and their contractor was obtained during extensometer installations. The installations were generally scheduled around routine cutter maintenance work. Figure I-5.1 shows the positions and typical layout of the MPBX's arrays. The anchor positions for each extensometer are summarized in Table I-6.1.

Rigid sonic probe extensometers were initially used to monitor rock displacements. Based on the collected displacement data, the zone of active rock movements was shown to be generally confined to the first 2 to 3 m from the excavation surface. Consequently it was agreed, at the review meeting in June 1984, that the flexible sonic probe extensometers, which could be installed in E size holes to a maximum depth of 7.6 m, but with more anchors, would provide more information within the near- surface zone. Furthermore each installation could be completed in approximately 2 hrs., thus allowing more flexibility in the timing of installation. The number and depth of anchors for a typical flexible sonic probe extensometer is shown on Figure I-5.1.

The extensometer holes (B size) for the rigid probe MPBX's at the face were drilled using a Gardiner-Denver 123 rotary percussion drill set up within the cutting head. Holes (42 mm dia.) for the flexible sonic probe MPBX's were drilled using a stoper because of the smaller size and shorter length of the holes. The extensometer holes (B size) behind the TBM were cored using the Longyear 38 mounted

on the TBM. Rigid sonic probe MPBX's were used in these holes.

During the drilling of the rigid probe extensometer holes at the face a number of problems occurred which necessitated modifications to the installation equipment and procedure. The first array (ch. 925 m) installed from within the head of the TBM was drilled with a bar mounted rig (AL 67). Due to the limited capacity of the drill the holes had to be drilled 38 mm diameter and reamed to the required 60 mm. This operation was very time consuming hence for the two subsequent arrays the extensometers holes were drilled with the Gardiner-Denver 123 . The holes for the flexible probe extensometers were drilled using a stoper which generally performed well with the exception of a few cases in which the drill steels became stuck in the hole due to insufficient water for flushing. The drilling of extensometer holes using the Longyear 38 drill was generally satisfactory.

Other problems were encountered during installation. In one case, one array (ch. 925) was drilled slightly undersize which made it necessary to grind the C-clip anchors to fit. The extensometers at ch. 925 and 1423 were obstructed by the ring beam when they emerged from behind the TBM (the length of TBM shield is 6.3 m). The extensometer at ch. 1423 could not be read, whereas the one at ch. 925 had to be chipped out at the hole collar before further readings could be taken. To overcome this problem subsequent extensometers at the face were installed after the TBM had stopped midway through a complete push (1.5 m).

I-6.2.3 Extensometer Installations in Tunnel No. 3.

Three arrays of rigid probe extensometers were installed in Tunnel No. 3. They included one array of three extensometers installed at the face after completion of the drill-

and-blast excavation, (at ch. 1027 m) and two crosshole extensometers from Tunnel No. 3 to Tunnel No. 2.

The face extensometers were installed in B sized holes in preparation for the continuation of the tunnel by drill-and-blast methods. To date this tunnel has not been advanced further and it is likely that further drill-and-blast excavation will be confined to an assembly chamber for the TBM.

The holes were drilled using a skid mounted Longyear 38 drill rig. No problems were encountered during drilling and, installation of these extensometers. Since installation access has been restricted to occasional readings mainly due to water at the face of the tunnel.

The two cross-holes were of N-size and drilled from Tunnel No. 3, starting from approximately 1.6 m above the invert to intersect Tunnel No. 2 close to the springline. Four anchors were installed in each of the holes at ch. 800 and 900 m. The purpose of these extensometers was to monitor the displacement of the zone of rock between Tunnels No. 2 and 3 as the TBM approached and passed those locations.

In general no problems were encountered during the drilling and installation but problems occurred during the reading of the installation at ch. 900 m (3T900EB). These problems appeared to have been related to the 6 mm (0.25 in) dia. stainless steel rods which probably either sagged between the anchors and spacers or stuck where they passed through successive anchors due to friction. Movement of the rods was activated by prodding the end of the rod when a reading was taken. This problem did not occur in the extensometer at ch. 800 m.

I-6.3 Measurement of Thrust Block Loads

The loads in the thrust blocks were indirectly measured by means of the surface strains on two opposite sides of the thrust block as shown on Figure I-5.1. The load/strain

relationship was calibrated by loading an instrumented thrust block to 445 kN. Strains in the thrust blocks were measured by means of Irad Gage weldable vibrating wire strain gauges as described in Table I-6.2.

In the first full array of instrumentation in tunnel No. 2, all thrust blocks below the springline and alternate thrust blocks above the springline were instrumented. In the light of the first set of results, only alternate thrust blocks were instrumented in array No. 2. In array No. 3, instrumentation of the thrust blocks was further reduced to eight blocks and in the final array, no thrust blocks were instrumented.

The strain gauges were installed at the mid-point on the top and bottom of each instrumented thrust block. The area was first cleaned using a wire brush, the gauges were then spot welded to the steel and the sensor covers welded over them (see Figure I-6.4). Each gauge was protected by a cover bolted to the thrust block. The cable supplied with the gauges was coiled inside the protective cover. The strain gauge installation was completed on surface and the instrumented thrust blocks were then transported underground for assembly along with the instrumented ring beams. The thrust block arrays were installed immediately outbye of the instrumented ring beam.

These installations generally went very well. Occasionally some gauges fell off during transportation and/or installation underground. Where this happened the gauges were subsequently epoxy glued to the thrust blocks during the cabling stage.

For the first array the strain gauges were supplied with either 6.1 m or 12.2 m of cable. This meant that thrust blocks had to be placed in designated locations to allow cabling to be taken to the central readout located at the springline on the east side wall.

This procedure was time consuming because splicing of cables was required for certain gauge positions. Subsequently the strain gauges were supplied with 1.5 m of cable and a waterproof connector. Extension cables were also supplied with a waterproof connector at one end and bare wires at the other end, in various lengths. The revised procedure proved to be more efficient and allowed flexibility in positioning the instrumented thrust blocks and ease of connection to the switch boxes.

I-6.4 Strain Measurements in Ring Beams

The strains in the ring beams were measured at two positions in each of the six steel set segments. The strain gauges were installed only on the web on the outbye side of the I beam (see Figures I-5.1 and I-6.5) because the TBM push ring was always in contact with the inbye side of the web during thrusting.

The strain gauges used were similar to those for the thrust blocks (described in Section 6.3). For each of the four instrumented arrays all ring beam segments were monitored.

The gauges were installed on surface prior to transporting the ring beams underground. The installation procedures were similar to those for thrust blocks and the comments regarding cabling and installation mentioned in Section I-6.3 apply equally to the ring beam strain gauges. Because of the size and method of handling of the beams more problems were encountered with gauges falling off during handling and assembly. Again these gauge were subsequently epoxy glued in place during the cabling stage.

I-6.5 Measurement of Pressures on Ring Beams

Irad Gage vibrating wire pressure cells (see Table I-6.2) were used to measure the radial and axial pressures on the

ring beams. Radial pressures were measured by installing curved pressure cells (900 mm long x 150 mm wide x 6 mm thick) on the outer circumference and axial pressures were measured by square pressure cells (150 mm x 150 mm x 6 mm thick) installed between the butt joints at the springline of the ring beam (see Figure I-5.1, I-6.6 and I-6.7). As the radial pressure on the ring beam occurs at the ring beam/rock interface it is also referred to as radial stress in the rock in Volume II of the report.

Due to the limited clearance available for the assembly of the support components within the TBM shield, the pressure cells were necessarily thin (6 mm thick) and manufactured to fit the flange width of the ring beam. The length of the curved pressure cells was selected to allow the pressures to be averaged over a reasonably large area of measurement. The pressure cells were also supplied with 1.5 m cables and connectors to facilitate subsequent cabling. All transducers were protected by metal protection boxes (Figures I-6.6).

The curved pressure cells were arc welded along the long edges (a 6 mm ledge was allowed for welding in the design) on the outer circumference of the ring beams. A 3 mm thick hard rubber pad was glued on the contact surface of the pressure cell (Figure I-6.6) to protect the instrument from damage during handling and to distribute more evenly the pressure applied to the cell.

Due to the close tolerance between the outer diameter of the ring beam and the inside diameter of the TBM shield, problems were encountered in one array (ch. 1889 m) where it was necessary to remove one of the axial (square) pressure cells to allow proper assembly of the complete ring beam within the shield. The procedures of cabling the pressure cells were the same as those for the strain gauges.

To allow the full rock support interaction characteristics to be studied, pressure cells and strain gauges for the ring beams were installed on the same ring beams for each of the full arrays of instrumentation (T2-1 to T2-4). The instrumented ring beam was generally prepared on the surface and transported underground for installation at the end of the back shift so that the instrumented ring beam was the last set to be installed prior to the weekend break. Cabling for the pressure cells and strain gauges (including those for the thrust blocks) was undertaken during the weekend period and during the first maintenance shift in the following week in preparation for monitoring when tunnel drivage resumed.

I-6.6 Measurement of Convergence

Convergence points were originally planned to provide a measurement of the surface displacement of the tunnel wall. The type of convergence anchors and tape extensometer used are described in Table I-6.2 and the layout of the convergence points are shown on Figure 6.8. However, due to the abundance of ancillary equipment and accessories trailing the TBM, it was not possible to take tape extensometer readings across the convergence points until the face was about 30 m away. Even at that point only the horizontal lines across the springline and just above the filled invert were available for monitoring. Because of these difficulties the convergence measurements are only sporadic.

Convergence points were installed at each of the four major array positions. Studs were located in short holes 300 mm long drilled with a jackleg. The studs were set in place using fast resin cartridges and the stainless steel ball was screwed into the stud and locked in position using Loctite. For convergence points installed on the ring beams, a small hole was drilled in the flange. After installation of the beam underground the ball was then bolted to the beam.

I-6.7 In situ Borehole Modulus Testing

In order to compare the influence of excavation methods on the rock mass, a program of in situ modulus testing was implemented following discussion at the review meeting in June 1984. The program involved testing in boreholes using the Colorado School of Mines dilatometer system. The test site was located in the Portal sandstone unit where both drill and blast and TBM excavation methods had been used.

To avoid disruption to the tunnelling program in tunnel No. 2, the borehole (E size) for insitu modulus testing was drilled from tunnel No. 3 to tunnel No. 2 using the Longyear 38 underground drill.

The testing program was carried out in November 1984 by personnel of Ontario Hydro's Civil Research Section under a subcontract with Golder Associates. A schematic of the equipment used for the borehole modulus determination is presented on Figure I-6.9.

As most of the equipment is non-permissible under the Coal Mines (CBDC) Safety Regulation, special dispensation was obtained from Labour Canada to use the equipment underground for a limited time period. To minimize the use of non-permissible electrical equipment, the hand pump shown on Figure I-6.9 was used in the place of an electric hydraulic pump. Detailed descriptions of the procedures and equipment is given by Koopmans and Hughs (1984). An outline of the test program is presented below.

The test program commenced in tunnel No. 3. When the hole for the in situ modulus testing was drilled at ch. 803 m, a section of drill rod was broken in the hole at approximately 8 m depth. The hole was abandoned and a second hole was drilled at about 1 m (ch. 804 m) from the first hole position through to tunnel No. 2. Prior to testing, the size of the holes were checked because the dilatometer was designed to fit a nominal 38 mm diameter hole with close tolerance.

It was discovered that the first 5.3 m (measured from tunnel No. 3), and the section from 9 m to 15 m of the through-going hole was too large for the dilatometer. It was decided therefore that the tests in tunnel No. 3 should be undertaken in the first hole (at ch. 803 m) to a depth of 7 m and in the second hole (at ch. 804 m), from 5.5 to 8 m.

The tests in the borehole were carried out at 0.5 m intervals starting at a position furthest from the hole collar. From a depth of 5.5 m, the tests were spaced at 0.25 m intervals to as close to the hole collar as possible (see Figure I-6.10).

During each test, six cycles of loading and unloading were undertaken and the maximum applied pressure was 24 MPa. A seating pressure of 3.0 MPa was used in each cycle. The applied pressure and the volumetric change of the section of borehole pressurized by the dilatometer were recorded and processed by a computerized data logging system. The equipment was calibrated by inflating the dilatometer within aluminum and steel cylinders of known elastic modulus prior to and after completion of a test series. Calibration was also carried out after replacement of the dilatometer due to breakage.

The tests in tunnel No. 2 were carried out at 0.5 m intervals in the hole at ch. 804 m commencing from a depth of 15 m. Between the hole collar and a depth of 5 m the spacing was reduced to 0.25 m (see Figure I-6.10). The maximum depth of testing was limited, in this case, by the available length of the high pressure line. The majority of the tests in tunnel No. 2 were undertaken during the weekend period when there was no tunnelling activity. Due to space restriction, only the essential data logging components were used in this series of tests.

I-6.8 Hammer Seismic Wall Survey

The purpose of the hammer seismic wall survey was to compare the seismic wave velocities within the zones adjacent to the

excavation surfaces of tunnels No. 2 and 3 in the "Portal sandstone unit". As the wave velocities are related to the dynamic modulus of the rock mass, this study provided a means of comparing the gross effect of the excavation methods on the integrity of the rock.

The hammer seismic survey was carried out by A-Cubed Inc. on behalf of Golder Associates. The survey was undertaken at six locations, three in tunnel No. 3 and three in tunnel No. 2. At the time of testing the support systems at the test locations in both tunnels had been installed. The seismic waves were generated by a hammer source and the wave travel times were measured by means of a series of geophones mounted on brackets which were secured by short mechanical anchors (0.3 m long) installed in the tunnel wall. It is considered that the ring beams would have negligible effects on the results of the measurement.

Figure I-6.11 shows the layout of a typical geophone spread and the test locations. In addition to the standard geophone spread, the E size hole drilled for the purpose of insitu borehole modulus testing was utilized to conduct a cross tunnel seismic survey. In this test, the hammer source was positioned in tunnel No. 3 and the geophones were placed in tunnel No. 2 (see Figure I-6.11) to detect the seismic waves transmitted through the rock mass between the two tunnels.

The equipment for the seismic survey comprised 12 geophones which were connected to a seismograph via a 12 conductor cable. The signals fed into the seismograph from the geophones were stored on a tape recorder for subsequent data processing. Special dispensation from Labour Canada was obtained to use this equipment during the testing period. As the tests were required to be undertaken in an environment with relatively low background noise level, the test program was carried out in tunnel No. 3 during the normal day shift hours and the tests in tunnel No. 2 and the cross hole work were conducted over the weekend period.

I-6.9 Laboratory Testing Program

The laboratory testing program for the project provided information about the mechanical properties of the rock including the strength and deformation characteristics and the mineralogy and fabric of the rock.

The mechanical properties of the rock were studied in the Rock Mechanics Laboratory of CANMET in Ottawa. The testing program included uniaxial compression tests, Brazilian (tensile) tests and triaxial tests.

The mineralogy of the samples was studied by means of thin sections for medium to coarse grained material such as sandstone and siltstone. For fine grained material such as mudstone, a semi-quantitative analysis was carried out, including X-ray diffraction analysis, carbonate content evaluation, pH value and potassium analysis. The thin section work and the mineralogical analysis were carried out by Dr. J.M. Allen and Dr. R.M. Quigley (University of Western Ontario) respectively under subcontracts to Golder Associates. The sample sources for mineralogy test are summarized in Table I-7.14.

In addition Shore Scleroscope hardness tests were also undertaken at the University of Toronto on eleven sandstone and siltstone specimens. In general two tests (each test consisted of 2 sets of axial readings from the ends and 1 set of circumferential readings) were performed on each specimen. However for specimens 3-5, 6-1, 7-2 and 7-3 (see Table I-7.14 for source of samples) only 1 test was performed as these specimens broke (along the bedding planes) into pieces in the process of cutting and lapping. For specimens 3-5, 6-1 and 7-3, the hardness test was only performed on the circumference as a smooth end could not be obtained. For specimen 7-2 only one complete test was performed as the sample received was too short.

The specimens used in the test conform to the following ISRM Standards:

(1) Test surface greater than or equal to 10 sq. cm. The specimens used in these tests have a diameter of 36.3 mm (area = 10.4 sq. cm).

(2) Minimum thickness of 1 cm. The minimum thickness of the specimens used was about 2.5 cm.

I-6.10 Geotechnical Data Available from CBDC

During drivage of the Donkin tunnels, geotechnical data was collected as part of the geotechnical quality control program undertaken on site. These data was made available by the Cape Breton Development Corporation and included tunnel convergence data for tunnel No. 3, shotcrete thickness and installed tunnel support at each instrumentation and in situ testing station, and observed performance of the support at each of these locations. The data is summarized and discussed in Section II-6 in part II of this report.

I-6.11 Performance of the Instruments

In general, the instruments performed satisfactorily in the underground environment. There was no apparent erratic instrument behaviour during the period of usage in the tunnels.

The sonic probe extensometers were easy to install provided the holes were drilled to the correct size. The flexible probe extensometers were useful in that they could be used to determine the distribution of displacement within close proximity of the excavation surface. Their shortcomings were the depth limitation (max. 7.6 m) and the susceptibility of the flexible probe to damage especially when used repeatedly in an underground environment. The high cost of the probe prohibited the retention of the instrument probe in the extensometer hole.

All the vibrating wire equipment performed satisfactorily. The curved load cells survived handling during installation and shear within the shield during TBM advance. Some of the strain gauges however, were dislodged during handling due to excessive vibrating. They were reinstalled with expoxy prior to cabling. Excessive strain in the web during pushing and water accumulations at the tunnel invert also caused some strain gauges to malfunction. The strain gauges on the thrust blocks generally gave satisfactory performance.

I-7. RESULTS OF INSTRUMENTATION AND TESTING

I-7.1 Background Information

This section presents the results of the field instrumentation and testing programs completed for various aspects of the study. In order to obtain detailed records of the changes in instrument readings in response to face advance, continuous monitoring was undertaken during the first two shifts of drivage following installation of the instruments. The frequency of reading was then reduced depending upon the rate of change noted in the readings themselves.

All instrument readings were taken manually as it was not practical to use a central data logging system to cover instrument arrays which were spread over a total distance of more than 2 km. The collected data was processed by computer and plotting programs were developed to display the data in graphical form. The raw data and graphical plots for all installed instruments are given in Appendix C.

I-7.2 Results of Insitu Stress Measurement

A total of four USBM tests and five CSIRO tests were undertaken for this series of stress measurements as described in Section I-6.1. The results of the overcoring tests are summarized in Table I-7.1. and details of the test results are included in Appendix B. The conclusions drawn from the measurements are presented below.

(a) Of the five CSIRO tests undertaken, only the first two tests were valid due to the formation of a network of air bubbles in the glue around the strain gauge tube in the deeper tests. The bubbles were likely caused by the slow seepage of groundwater during the curing of the glue. All USBM tests were successful.

(b) There is a distinct change in the deformation modulus of the rock along the length of the drillhole. The deformation modulus correlates reasonably well with the grain size and the degree of matrix cementation of the rock. On the basis of examination of the overcore under a microscope, it was found that the high modulus material is fine grained and is well cemented. The lower modulus material is coarser in grain size, not as well cemented and has definite intergranular porosity. The modulus of the rock when wet was generally about 10 percent lower than that when dry.

(c) Based on the results of biaxial tests on the overcores, the deformation characteristic of sandstone in which the stress measurements were undertaken is linear and isotropic within the range of stresses measured.

(d) The principal stresses obtained from the CSIRO tests and the USBM tests were resolved into vertical component (σz) and horizontal components in the directions parallel to (σx) and normal (σy) to the tunnel axis (see Table I-7.1). The magnitude of stress components derived from the CSIRO and USBM tests are consistent with each other. The tunnel excavation has a definite influence on the stress around the tunnel and the zone of major influence appears to extend to a distance of about one tunnel diameter from the tunnel wall.

(e) The average vertical stress measured at ch. 964 m in tunnel No. 3 is about 15 percent higher than the static vertical stress calculated from the weight of the rock and water above the test location. This is within the range of variations in vertical stresses measured elsewhere in Canada and in other parts of the world.

(f) Due to the problem of the formation of bubbles in the glue, complete stress tensors were not measured in zones sufficiently far away from the tunnel excavation. The overall results indicate that the rock strata is under a moderately high insitu horizontal stress. Based on the USBM test results the ratio of maximum horizontal to vertical insitu stresses is of the order of 2 to 3.

I-7.3 Results of Displacement Monitoring

I-7.3.1 Organization of Data

Displacement monitoring was carried out using extensometer and convergence arrays. Data tables showing the raw data and reduced readings are given in Appendix C-1.

The extensometer data tables include an instrument reference number which is composed of the tunnel no., chainage and instrument designation. For example, the reference number of extensometer 2T925EA indicates the following:

2T	-	Tunnel No. 2
925	-	Chainage along tunnel (m)
E	-	Extensometer
A	-	Location:

A - vertical up
B - horizontal west
C - horizontal east
D - vertical down

Included in each data sheet are the installation date and Datum readings as the first reading column. The anchor numbers may be interpreted as follows i.e. A1 (3 m)

A1	-	Anchor number
(3 m)	-	Depth from collar of hole

For each set of readings a table is presented in Volume IV. Each table indicates the type of instrument the date installed, the tunnel, and the chainage. In addition, notes and comments are provided to assist in interpreting the data i.e. "Probe number 128". Sensor locations are given in column 1 of the table, datum readings are provided in column 2. These and all subsequent values marked "Reading" constitute raw data (measured in inches in the case of the extensometers). The Diff mm column presents the change in reading from the datum in millimeters.

a) For rigid probe extensometers (with calibration)

$$\text{Diff. (mm)} = 25.4\ (r_1 - r_o + c_o - c_1)$$

b) For flexible sonic probe extensometers (no calibration)

$$\text{Diff. (mm)} = 25.4\ (r_1 - r_o)$$

where 25.4 = conversion inches to mm
r_1 = reading taken (in)
r_o = datum reading (in)
c_o = datum calibration reading (in)
c_1 = calibration at time of reading r_1 (in)

For all readings positive values indicate displacement of the head of the instrument towards the tunnel opening relative to the anchor.

The convergence data tables are formatted in a manner similar to the extensometer data. A typical instrument code such as 2T920C (Rock) would be interpretted as follows:

2T - Tunnel No.
920 - Chainage along tunnel (m)
C - Convergence array
(Rock) - Convergence studs in rock or on (Steel) ring beams

The line numbers are designated as follows:

L - 1-4 - Line 1-4

Line 1-4 is the horizontal line just above the filled invert of the tunnel (see Figures I-6.8).

For each set of readings of a particular instrument array the date and time are shown as well as the raw data measured on the tape (m), and on the gauge (mm). The temperature (°C) is also shown. The "Diff. mm" column is the change in reading in mm from the datum.

a) For convergence arrays including calibration readings

$$\text{Diff. (mm)} = 10\,(R_{to} - R_{t1} + C_{t1} - C_{to}) + R_{g1} - R_{go} + C_{go} - C_{g1}$$

b) For convergence arrays with no calibration readings

$$\text{Diff. (mm)} = 10\,(R_{to} - R_{t1}) + R_{g1} - R_{go}$$

where

10	=	conversion cm to mm
R_{to}	=	datum measurement on tape (cm)
R_{t1}	=	reading on tape (cm)
C_{t1}	=	calibration reading on tape (cm)
C_{to}	=	calibration datum measurement on tape (cm)
R_{g1}	=	dial gauge reading (mm)
R_{go}	=	datum dial gauge reading (mm)
C_{go}	=	calibration datum dial gauge reading (mm)
C_{g1}	=	calibration dial gauge reading (mm)

For all convergence readings positive values indicate convergence.

The extensometer plots showing displacement (mm) against time (date) are given on Figures C.1 to C.22 in Appendix C. The plots show the instrument number, plot of displacement for each anchor (relative movement between anchor and reference head). Also indicated in the plots are the face chainage with respect to time, an indication of the time at which support was installed, the final reading taken (indicated on the right side of the plot) and a sketch of the location including rock types. No convergence plots are included as only sporadic data was available.

I-7.3.2 Tunnel No. 3

Excavation in tunnel No. 3 has not advanced since the installation of the extensometer arrays at the face. There has been very little change in the instrument readings.

The results of displacement monitoring by cross hole extensometers at ch. 800 and 900 m are shown on Figures C.1 and C.2 respectively in Appendix C. The progress of the TBM during the period of monitoring is also shown on the same figures. It may be noted that the extensometer movements generally corresponded closely with the TBM advance. The stepped movements in the extensometer at ch. 900 might be the result of friction at the anchors through which the extensometer rods moved. The results may be of use if the steps are eliminated from the plot and the peaks taken as the correct results.

Convergence monitoring in Tunnel No. 3 was undertaken during the drivage by drill and blast under a separate contract. The data from these installation is also given in Appendix C.

I-7.3.3 Tunnel No. 2

Rock displacements at the extensometer locations in tunnel No. 2 are presented on Figures C.3 to C.22 in Appendix C.

The time of support installation is indicated on the plots for extensometers installed within the head of the TBM. In general the majority (approximately 50-60%) of the displacement took place when the face was within 10 m of the instrumented section. Thereafter, the rate of displacement gradually decreased and the readings stabilized as the face proceeded further. The time dependent effect is relatively more significant at the crown and invert. The extensometers installed on the sidewall above the springline only showed very modest time dependent behaviour.

As discussed earlier in Section 6 of the report, the data based on the rigid sonic probe extensometers indicated that the zone of active movement is limited to about 3 m from the excavation surface. This was confirmed by the data from the flexible sonic probe extensometers. The use of a larger number of anchors within the zone of active movement has provided a very good picture of the distribution of displacement in the rock strata. Further discussions on the results of the displacement measurements and their implications are given in Volume II of the report.

I-7.4 Results of Measurement of Thrust Block Loads

Data tables showing the raw data and reduced readings for thrust block measurements are given in Appendix C. The data tables include instrument number, tunnel number, chainage, date installed and datum readings as the first reading. A thrust block instrument reference number might typically be TIA where:-

where T1 - thrust block number corresponding to the push cylinder number on the TBM (see Figure I-5.1).

A - location A - upper side of thrust block
B - lower side of thrust block

For each set of readings the date, time and chainage are shown. Datum and individual readings are shown between (measurement periods) and the differences between the datum and subsequent values are also shown

$$Diff = r_o - r_1$$

where r_o = datum reading
r_1 = reading taken on date shown

For all readings, positive values are compressive, and negative values tensile.

The expression for calculating the thrust loads from the strains is as follows:

P = 2E at (S1 + S2) (kN)
E = deformation modulus = 206 GPa
a = size of thrust block
= 93.7 mm
t = thickness of thrust block
= 7.9 mm
S1, S2 = top and bottom strains

This expression was calibrated by testing an instrumented thrust block to 445 kN. The results of the calibration are presented in Table I-7.2.

The results of the thrust load measurements for all the instrumentation arrays are presented on Figures C.23 to C.98 in Appendix C. It will be noted that two (2) graphs are presented for each thrust block; The short term graph depicts the changes in the thrust loads from the time when the TBM started to push against the thrust blocks to the end of the following shift. The effects of on-load (TBM pushing) and off-load (rams retracted) of the TBM on the thrust loads are presented on the graphs. The long term graph presents only the on-load effect of the TBM to illustrate the variation of thrust load with time.

On each graph, the thrust load at any given time is obtained by reading off the load axis on the basis of the sum of the load value corresponding to each gauge. The position of the instrumented thrust block on the ring beam is highlighted on the plot and the final readings are indicated on the right hand margin.

Discussions of the results of the measured thrust load, their distributions with respect to distance from the face, and the effect of pinning of ring beams on the dissipation of the thrust loads are presented in Volume II of the report.

I-7.5 Results of the Measurement of Strain in the Ring Beams

Data tables showing the raw data and reduced readings for the ring beam strain measurements are given in Appendix C. The data tables include instrument number, tunnel number, chainage, date installed and datum readings as the first reading column. The steel set gauge numbers are typically designated as SS1A where

SS1 - Steel Set segment number 1 to 6. (see Figure I-5.1)

A - Location A - Left upper side
B - Left lower side
C - Right upper side
D - Right lower side

For each set of readings the date, time and chainage of the readings are shown as well as the raw data "Reading" and the difference "Diff" as a difference in period between the readings and the datum.

$$\text{Diff} = r_o - r_1$$

where r_o = datum reading
r_1 = reading taken on date shown

For all readings positive values are compressive and negative values tensile.

The measured strains in the steel sets for all the instrumentation arrays are presented for each segment separately on Figures C.99 to C.146 in Appendix C including both short and long term graphs. The numbering system for the strain gauges is described above and shown on Figure I-5.1. The position of the instrumented segment for strain measurement purpose is highlighted on each of the plots and the final readings are shown on the right hand margins.

In view of the design of the support components and the thrusting mechanism of the TBM, strain changes in the steel set would occur as it went through the following cycles of operation during the TBM driveage.

- o installation of the steel set within the TBM shield
- o thrusting of the TBM-the steel set was subjected to the full thrust load transmitted through the push ring,
- o expansion of the steel set as it came out of the shield: - the steel sets were pushed against the rock surface by the rib expander and spacers were placed at the butt joints of the crown segment

Hence, there were considerable strain changes in the ring beam during the initial stage as reflected in the results. Further discussion of the strain measurements are presented in Volume II of the report.

I-7.6 Results of Measurement of Pressures on the Ring Beams

Data tables showing the raw data and reduced readings for the steel set stress cell measurements are given in Appendix C. The data tables include instrument number, tunnel number, chainage, date installed and datum readings. A typical stress cell reference number such as SCI indicates the sensor position where:

SC1 - circumferential stress cell on segment numbers 1 to 6 (see Figure I-5.1)

SC7 (Axial) - axial stress cell at springline joint
- SC7 - west side
- SC8 - east side

For each set of readings the data, time and chainage of the tunnel are shown as well as the raw data ("reading" column) and the pressure calculated from the calibration charts shown in the P (MPa) column.

$$P(MPa) = G_f (r_o - r_1)$$

where G_f = Gauge factor from calibration graphs supplied with each unit

r_1 = reading taken on date shown

r_o = datum reading

The results of the pressure measurements for all the instrumentation arrays are presented on Figures C.147 to C.162 in Appendix C, including both short and long term graphs. The radial and axial pressure measurements are grouped separately for each array of instrumentation. The pressure indicated on the graphs represents the average pressure measured over the area of the pressure cell. The position of the pressure cell (the terms "stress cell" and "pressure cell" are used interchangeably in the report) on the ring beam is highlighed on each graph and the final readings are shown on the right hand margin. The time of ring beam expansion is also indicated.

As described in Section 6, the pressure cells and the strain gauges were installed on the same steel set. Since they pass through the same cycle of TBM operation as described earlier, the ring beam would not be in full contact with the rock until it was expanded against the rock surface (after the machine has advanced about 3 m).

The variations in the loading on the ring beam during this stage were generally reflected in the pressure readings. As the tunnel advanced further, the increase in rock load generally caused an increase in both the radial and axial pressures. It may also be noted that higher radial and axial pressures were measured in the mixed sediments (ch. 1423, 1831 and 3353 m are in mixed sediments) than in the sandstone unit (ch. 984 m). Within the mixed sediments it appeared that the overall pressure in the ring beam was higher when deformation of the crown segment was restrained by a relatively more rigid butt joint (see Table 1-5.1).

The radial pressure at the crown segment was generally lower than those in other segments. This is partly attributed to the fact that at the crown of the tunnel, the rock is usually broken into small slabs or fragments prior to the installation of the ring beam. Hence, contact in this area would not be as good as the other segments. Detailed discussion of the results and analysis of rock-support interaction are presented in Volume II.

I-7.7 Results of Insitu Borehole Modulus Testing

The calculated deformation moduli for each borehole are given in Table I-7.3 and shown in graphical form with depth from the borehole collar in Figures I-7.1 and I-7.2. Individual results are shown in the form of Volume change (cc) against Pressure (MPa) on Figures D.1 to D.71, in Appendix D.

The complete derivation of the equations required for the calculation of deformation modulus of rock is provided by Hustrulid and Hustrulid (1975). Only the basic equations are presented here. The only change in these equations is that calculations are now expressed as pressure-volume instead of pressure/turn. The intensifier moves in a linear direction and eliminates the need to read rotational turns inherent in the original Colorado School of Mines system. The systematic progression of calculations (Koopmans and Hughs, 1984) is shown below.

Step 1 - The pressure-volume relationship (Mc) for the cylinder alone is calculated:

$$Mc = \frac{\gamma \; Gc}{\pi \; L \; r^2_{ic} \left[\frac{1 + \beta c}{1 - \beta c} \times \frac{2 \nu c \; \beta c}{1 - \beta c}\right]}$$

where
- γ = volume of fluid displaced
- Gc = modulus of rigidity of the calibration cylinder
- L = length of membrane
- βc = $(r_{ic}/r_{oc})^2$
- r_{ic} = inner radius of calibration cylinder
- r_{oc} = outer radius of calibration cylinder
- ν_c = Poisson's ratio

Step 2 - The slope of the pressure-volume curve (Mm) for the system plus the calibration cylinder is determined.

Step 3 - The stiffness of the pressurizing system (Ms) alone is calculated:

$$Ms = \frac{Mc \; Mm}{Mc - Mm}$$

Step 4 - The slope of the pressure-volume curve (Mt) for the pressurized system plus rock is determined.

Step 5 - The pressure-volume relationship (Mr) for the rock alone is calculated:

$$Mr = \frac{Ms \;\; Mt}{Ms - Mt}$$

Step 6 - The modulus of rigidity of rock (Gr) is calculated:

$$Gr = \frac{Mr \quad \pi \quad Lr^2}{\gamma}$$

where r = radius of borehole in rock mass

Step 7 - The deformation modulus (E_r) of the rock can be calculated if Poisson's ratio (ν_r) is known (or can be assumed):

$$E_r = 2(1 + \nu_r)\, Gr$$

Only the straight line portions of the pressure-volume curves are utilized in the determination of Mm and Mt. The initial curved portions of the graphs are neglected since they represent the closure of fractures and the seating of the adiprene membrane.

Preliminary interpretation of the test results and comparison of the in situ and laboratory deformation moduli are presented in Volume II of the report.

I-7.8 Results of Hammer Seismic Survey

The hammer seismic data recorded in the field was transferred to computer and the plots developed. The detailed procedure and raw data plots are available in the report entitled 'Underground Seismic Surveys, Donkin-Morien Development Project' by A-Cubed Inc. (A copy of this report is kept on file at the Cape Breton Coal Research Laboratory, Nova Scotia).

For each spread of geophones eight sets of data from the twelve channels were collected. Each data set was plotted using the variable area data format, and has been analyzed to determine p and s wave velocities of the tunnel sidewall.

Seismic Wave Velocities

Each data set has been analyzed to obtain the onset of the p and/or s wave arrivals. p waves were be strongest on shots designated 1, 4, and 6 (see Figure I-6.11 for shot types). s waves were strongest on shots designated 2, 3, 5, 7 and 8. In addition shots 2 and 3 as well as 7 and 8 showed opposite polarity for s wave arrivals. The arrival times were used to obtain p and s wave velocities at each spread. The resulting veolocities are summarized in Table I-7.4 for Tunnel No. 2 and in Table I-7.5, for Tunnel No. 3.

For each spread, individual velocities as well as average velocities are tabulated. Questionable velocities were not included in the computation of the average velocity values.

The cross tunnel data has been analyzed to obtain the initial break on each data trace. The initial break corresponds to the p wave arrival. It proved impractical to discern s wave arrivals in the cross hole data. The initial break data are tabulated in Table I-7.6.

Cross Tunnel Survey

The cross tunnel survey provides a means of obtaining the bulk p wave velocity for the sandstone. The velocity is derived using a standard $T^2 - X^2$ seismic interpretation procedure. Plotting travel time (T) squared versus geophone offset from the centre line (X) squared should result in a straight line relationship. The slope of the line is inversely proportional to $(V_p)^2$. The resulting p wave velocity is 4080 m/s. The tunnel separation can be inferred from the X=0 travel time and the value of V_p. This analysis yields a tunnel separation of 38 m whereas the actual tunnel separation was 42 m. These distances are

comparable and reflect the accuracy of the measurement procedure and shot-geophone positioning.

Dynamic Deformation Modulus

On the basis of the seismic velocity data, the dynamic deformation modulus and the Poisson's ratio of the rock mass can be estimated using the relationships summarized in Table I-7.7, and a bulk density of 2.48 Mg/m^3 for rock. The calculated results at each geophone spread are summarized in Table I-7.8. Average p and s waves velocities were used in the computation.

Seismic Velocity Layering

During the hammer seismic survey the variation of seismic velocity in the tunnel wall was examined. Only very weak variations were observed and these were at the threshold of resolution of the survey. The data from Tunnel No. 2 was sufficiently noise free that it could be plotted with very high gain factors. A general trend of increasing p wave velocity with shot-geophone spacing was generally discernible.

The data for all spreads were similar and are summarized in Table I-7.9 which gives p wave velocities versus shot-geophone spacing. Using a standard refraction seismic interpretation technique for a stratified model indicates that the following variation in seismic velocities with depth occurs from the tunnel wall in Tunnel No. 2.

0 - 0.6 m	Vp = 1800 m/s
0.6 - 1.2 m	Vp = 3000 m/s
1.2 m	Vp = 4000 m/s

Noise levels in Tunnel No. 3 precluded any positive indication of such trends in the seismic velocity.

I-7.9 Results of Laboratory Testing

I-7.9.1 Uniaxial Compression Tensile and Triaxial Tests

The results of the uniaxial compression tests, Brazilian (tensile) tests and triaxial tests are summarized in Tables I-7.10 to I-7.13.

Samples were selected from the five major rock types from the following boreholes.

3T800EB	-	Crosshole extensometer from Tunnels No. 3 to 2
3T804	-	Insitu borehole modulus test hole
3T900EB	-	Crosshole extensometer from Tunnels No. 3 to 2
3T1025EA/ED	-	Samples from all five rock types in vertical extensometer holes drilled vertically up and down at the face of Tunnel No. 3
2T1420	-	Samples from rock types III & IV in Tunnel No. 2
2T1881	-	Samples for triaxial testing of rock types II & III in Tunnel No. 2
2T2471	-	Samples from rock types III & IV in Tunnel No. 2

For each of the uniaxial compression tests the average values of σ_c and E are given with standard deviation and range of results. In addition the value of Poisson's ratio is given for the crossholes from Tunnel No. 3 to Tunnel No. 2 (Table I-7.10).

Brazilian (tensile) tests were carried out in the extensometer holes at the face of Tunnel No. 3. For these tests the average value of σ_t is given for each rock type along with standard deviation and range of values (Table I-7.11).

Triaxial tests were carried out on samples of rock type II and III from chainage 1881 m in Tunnel No 2. For these tests values of the principal stresses and modulus of elasticity are given (Table I-7.12).

An overall summary of the strength and deformation modulus of each rock type is presented in Table I-7.13.

I-7.9.2 Thin Section Mineralogy Tests

Eleven drill core samples of the mixed sediments have been studied in thin section to determine their mineralogy and texture. Details of the source of samples are given in Table I-7.14. In order to be able to correlate mineralogy with the results of hardness testing, accurate mineralogical compositions of each sample (i.e. modal compositions) were determined by point counting on a grid system with one millimeter spacing. Depending on sample heterogeneity, between 200 and 350 points were determined per sample, along traverses perpendicular to sedimentary layering.

Detailed descriptions of the mineralogical composition of each of the samples tested are given in Appendix E.

One problem arose with the plucking of soft kaolinite cement from sandstones 2-1, 2-5, 5-1 and 6-2 during thin section grinding. For the purposes of point counting, holes with adhering kaolinite were counted as if they were entirely filled by this mineral. The possibility exists however, that clastic grains were also plucked and miscounted as kaolinite, in which case the modal percentages for kaolinite are maximum values only.

Modal abundances of minerals and clasts in each sample are also listed in approximate order of decreasing hardness, with those of similar hardness grouped together:

Mineral/clast type	Mohs hardness number
quartz, feldspar, pyrite	6 - 7
sandstone, siltstone, mica schist clasts	
shale clasts	
siderite	4
micas, chlorite	2 1/2 -4
barite, calcite	3 - 3 1/2
clays	2 - 2 1/2

I-7.9.3 X-Ray Diffraction and Chemical Analyses

Five samples of mudstones from Strata Control Holes (BH 2 to 7, see Table I-7.14) were subjected to X-ray and chemical analyses. Detailed descriptions of each sample are presented on Table I-7.15. The testing program consisted of the following:

- X-ray powder patterns on pulverized whole rock specimens.
- X-ray traces on oriented, <2μ m fines, water wet, air dried, glycolated and heated to 550°C.
- X-ray traces on oriented, <2μ m fines, potassium saturated and x-rayed as in item 2.
- X-ray traces on oriented, <2μ m fines, hot-digested in HCl for 15 minutes to test for kaolinite.
- Carbonate analyses of gasometric analysis.
- Soluble salts by conductivity meter and chloride ion by specific ion electrode on 1:5 soil:water mixtures.
- pH of 1:5 soil:water mixtures.

The results of these analyses are presented in the following sections.

X-ray Diffraction Results

Powder Patterns

Powder patterns for the five samples are presented in Appendix E, Figures E.1 to E.3. The samples are fairly similar, all containing abundant quartz, kaolinite/ chlorite and illite. Carbonate is normally present in insufficient amounts (2-5%) to yield a peak at 0.303 m except for the sample from BH 5 (32.91 - 33.14 m) which yielded a strong peak and contained - 19% carbonate.

The powder patterns show a number of small low angle peaks (4 - 7° 2θ) which are suggestive of complex interlayered clays discussed later.

Small amounts of feldspar may also be present in the sample from BH 7, 6.36 - 6.54 m.

Oriented Fines

X-ray traces obtained on oriented fines, natural and K^+ saturated are presented in Appendix E, Figures E.4 to E.13 inclusive. The sample from BH 3, 13.81 - 13.97 is fairly typical and consists of kaolinite and iron chlorite (0.72 nm peak), illite (1.0 nm peak) and interlayered illite-smectite (shoulder on low angle side of 1.0 nm peak). Heat treatment at 550°C destroys the 0.72 nm peak and creates a 1.38 nm peak in most cases, a feature typical of iron chlorite.

The large shoulder on the trace for the air dried clay decreases somewhat on glycolation for the natural samples. The opposite happens on K^+ saturation, the shoulder

increasing in size on glycolation compared to the air dried state. Apparently the smectitic phase is low charge montmorillonite rather than vermiculite which would have been completely collapsed by the K^+ treatment.

Small amounts of smectite also seem to be present in other interlayered or hydrated forms producing small low angle peaks which shift around depending on soil treatment.

Since both chlorite and kaolinite seemed to be present in the samples, three specimens of <2 µm clay were digested in 1 n HCℓ for 15 minutes and x-rayed as before yielding the traces shown on Figures E.14, Appendix E. Kaolinite is more resistant to acid attack than chlorite so the latter should be removed by the treatment.

The sample from BH 3, 13.81 - 13.97 m shows a strong 0.72 nm kaolinite peak after acid digestion and No. 1.4 nm peak after heating to 550°C for 30 minutes. The chlorite originally present (1.4 nm peaks on Figures E.4 and E5) appears to have been removed by the HCℓ treatment. Similar results are indicated for the samples from BH 5, 32.91 - 33.14 m and 35.87 - 36.11 m depths.

Another feature of the traces for BH 3, is the apparent removal of most of the small low angle peaks by acid digestion. This suggests that chlorite interlayered with smectite and/or illite may have been a major component of these peaks. Certainly, the relative size of the 1.0 nm illite peaks seems to have been greatly increased by acid digestion but without destruction of the interlayered smectite phase.

In summary, the minerals present in the mudstones are:

Abundant:	Quartz, kaolinite and illite
Moderate:	Iron chlorite and interlayered illite/smectite
Minor:	Carbonate (except abundant in BH 5, 32.91 - 33.14 m)
Trace:	Feldspars and very complex interlayered clays.

Chemical Results

The chemical analyses are presented on Table I-7.16.

As noted previously, carbonate only amounts to between 2 and 5% in most samples which is insufficient to produce peaks on the x-ray powder patterns. The sample from BH 5, 32.91 - 33-14 m contains - 19% carbonate which yielded a large 0.303 nm calcite peak.

The soluble salts vary from 0.38 to 1.45 mg/g (0.04 to 0.145%). For an assumed water content of 4% for the mudstones these values would correspond to pore fluid salinities of approximately 10 to 36 g/L depending on the sample.

Chloride ion values vary from 0.04 to 0.61 mg/g and generally follow the salinity values in relative magnitude.

All samples are alkaline, the supernatant liquid on the 1:5 soil: water mixtures yielding values of 9.0 to 9.3.

I-7.9.4 Scleroscope Hardness Testing

A summary of all Shore Scleroscope test results is given in Table I-7.17. For details of the sample sources refer to Table I-7.14.

I-8 SUMMARY

In this volume (Volume 2) of the report, the scope of the research program; the geological conditions encountered; the tunnel support system; the instrumentation and testing program for various aspects of the study; and the data collected from laboratory tests, field instrumentation and testing have been presented. Data tables and plots, and other relevant data referred to in the text of this volume are contained in the Appendices in Volumes III and IV. A preliminary and limited analysis of the field data is presented in Volume II of the report.

TABLE I-3.1

SUMMARY OF SCOPE OF WORK FOR TUNNEL RESEARCH PROGRAM

PART	ASPECT STUDIED	SCOPE OF WORK	REMARKS
1	Measurement of deformation characteristics in drill and blast section of tunnel No. 3	(a) Measurement of displacement in tunnel No. 3 by means of surface convergence arrays and multiple point borehole extensometers (MPBX's) (b) Measurement of displacement in tunnel No. 2 by means of MPBX's installed at two locations from tunnel No. 3 (crosshole from tunnel No. 3 to tunnel No. 2) ahead of the TBM face	MPBX's were installed at the face but the extension of the drill and blast section in tunnel No. 3 was not undertaken.
2	Measurement of deformation and rock support interaction in TBM drivage in tunnel No. 2	(a) Four (4) arrays of instrumentation, one within the sandstone and three within the mixed sediments The following measurements were carried out at each array •measurement of axial loads on thrust blocks (1) •measurement of strains in the steel sets	

NOTES: (1) Axial loads on thrust blocks were not measured for the 4th array (T2-4)

TABLE I-3.1 (cont'd)

SUMMARY OF SCOPE OF WORK FOR TUNNEL RESEARCH PROGRAM

PART	ASPECT STUDIED	SCOPE OF WORK	REMARKS
2 (cont'd)		•measurement of radial pressure on the steel set •measurement of circumferential pressure between steel set segments •measurement of tunnel deformation by means of MPBX's at the face and behind the TBM shield •measurement of horizontal convergence across the tunnel	
		(b) Measurement of rock displacement using MPBX's installed in the crown at locations of geological significance	A total of 9 MPBX's were installed in addition to those installed in 2(a) above

TABLE I-3.1 (cont'd)

SUMMARY OF SCOPE OF WORK FOR TUNNEL RESEARCH PROGRAM

PART	ASPECT STUDIED	SCOPE OF WORK	REMARKS
3	In situ stress determination and specialized testing	(a) In situ stress measurements in sandstone (1st series) (b) Hammer seismic wall survey in tunnels 2 & 3 (c) Insitu modulus testing in boreholes between tunnels (d) Laboratory testing (carried out by CANMET) (3) Thin section and mineralogy work, and hardness testing	Stress measuresment in the mixed sediments (2nd series) were deleted from the program.
4	Limited & preliminary interpretation and analysis of field data	Limited and preliminary analysis of the results using analytical and numerical techniques	

TABLE I-5.1

SUMMARY OF OBSERVED PERFORMANCE OF RING BEAMS

DETAILS OF COMPONENTS AT BUTT JOINTS ADJACENT TO THE CROWN SEGMENT	CHAINAGE	OBSERVED PERFORMANCE
1. Sliding joints at end of crown segment to allow an expansion of up to 210 mm per joint. The sliding joint was locked in place after expansion of the ring by means of a friction plate bolted to the sliding joint and a steel wedge was placed through the slot in the sliding joint.	Portal - 1480 m	The sliding joint performed satisfactorily from the portal to ch. 1350 m in the massive "portal sandstone" unit. Between ch. 1350 m to 1430 m in the mixed sediments, the sliding joint closed due to increased rock load. High stresses were induced at the contact of the steel wedge and the web of the ring beam resulting in relatively large vertical deformation of the crown segment. 3.5 m rockbolts and straps were used to support the crown segment between ch. 1360 and 1429 m.
2. Sliding joint at end of the crown segment used with no steel wedge. The joint was allowed to slide when the crown segment took on load.	ch. 1480 m - 1620 m	Sliding joints generally closed gradually under loading from the loosened rock. Relatively large vertical deformation occurred in the crown segment. The support system was stable.
3. Sliding joint at end of the crown segment used in conjunction with 150 mm long spacers to limit closure of sliding joint to 50 mm (maximum)	ch. 1620 - 2047 m	Sliding joints generally closed under loading from the loosened rock. The support system was stable.
4. Sliding joint at end of segment was completely closed prior to ring beam expansion. 150 mm long spacers were used with timber wedges.	ch. 2047 - 3570 m (end of ringbeam installation)	The timber wedges were slightly compressed as the circumferential thrust in the ringbeam gradually increased. The support system was stable.

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TABLE I-6.1

ROCK SUPPORT INTERACTION STUDY AT DONKIN
SUMMARY OF INSTRUMENTATION IN TUNNEL 2
(ARRAY T2-1 - CH. 918 - 984 m)

INSTR. ARRAY	INSTRUMENTS														
	MPBXS			CONVERGENCE POINTS			VW STRAIN GAUGES ON THRUST BLOCKS			VW STRAIN GAUGES ON STEEL SETS			VW PRESSURE CELLS		
	Chainage (m)	Date*	Ref. No/ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes
T2-1	918	2.4.84	2T918ED(R) (3,10,19.5)	918	28.3.84	10 CON.PTS IN ROCK	984	7.4.84	T1A, T1B T4A, T4B	984	7.4.84	SS1A-SS1D	984	7.4.84	SC1 SC2
	925	1.4.84	2T925EA(R) (3,8.5)	984	9.4.84	10 CON.PTS ON ST.SETS			T5A, T5B T8A, T8B			SS2A-SS2D			SC3 SC4
	925	1.4.84	2T925EB(R) (3,10,21)						T9A, T9B, T12A,T12B			SS3A-SS3D			SC5 SC6
	925	1.4.84	2T925EC(R) (1,2,21)						T13A,T13B T14A,T14B			SS4A-SS4D			SC7 (SC8)+
									T15A,T15B T16A,T16B			SS5A-SS5D	+SC8 WAS REMOVED BECAUSE RING BEAM WAS TOO TIGHT		
									T17A,T17B T18A,T18B			SS6A-SS6D			
									T19A,T19B T20A,T20B						
									T21A,T21B T22A,T22B						
									T23A,T23B T24A,T24B						
							RAMS USED 1, 2, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24								

NOTES:
1. *DATE INSTALLED
2. 2T918ED (3,10,19.5) INDICATES TUNNEL 2 CHAINAGE 918, EXTENSOMETER, ORIENTATION D, ANCHORS AT 3, 10, AND 19.5 M FROM HOLE COLLAR
3. REFER TO FIGURE I-5.1 FOR LAYOUT OF INSTRUMENTS
4. (R),(F) REFER TO RIGID (FLEXIBLE) PROBE EXTENSOMETER

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TABLE I-6.1

ROCK SUPPORT INTERACTION STUDY AT DONKIN
SUMMARY OF INSTRUMENTATION IN TUNNEL 2
(ARRAY T2-2 CH. 1420 - 1428 m)

INSTR. ARRAY	INSTRUMENTS														
	MPBXS			CONVERGENCE POINTS			VW STRAIN GAUGES ON THRUST BLOCKS			VW STRAIN GAUGES ON STEEL SETS			VW PRESSURE CELLS		
	Chainage (m)	Date*	Ref. No/ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes
T2-2	1420	28.5.84	2T1420ED(E) (3,10,21)	1420	28.5.84	4 CON.PTS IN ROCK	1423	24.5.84	T1A, T1B T4A, T4B	1423	24.5.84	SS1A-SS1D	1423	24.5.84	SC1 SC2
	1428	26.5.84	2T1428EA(E) (3,10,21)	1423	28.5.84	4 CON.PTS ON ST.SET			T5A, T5B T8A, T8B			SS2A-SS2D			SC3 SC4
	1428	26.5.84	2T1428EB(E) (3,10,21)						T9A, T9B T12A,T12B			SS3A-SS3D			SC5 SC6
	1428	26.5.84	2T1428EC(E) (3,10,21)						T13A,T13B T16A,T16B			SS4A-SS4D			SC7 SC8
									T17A,T17B T20A,T20B			SS5A-SS5D			
									T21A,T21B T24A			SS6A-SS6D			
							RAMS USED 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 RAMS 5 and 6 WERE NOT USED AFTER FIRST PUSH								

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TABLE I-6.1

ROCK SUPPORT INTERACTION STUDY AT DONKIN
SUMMARY OF INSTRUMENTATION IN TUNNEL 2
(ARRAY T2-3 - CH. 1831 - 1889 m)

INSTR. ARRAY	INSTRUMENTS														
	MPBXS			CONVERGENCE POINTS			VW STRAIN GAUGES ON THRUST BLOCKS			VW STRAIN GAUGES ON STEEL SETS			VW PRESSURE CELLS		
	Chainage (m)	Date*	Ref. No/ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes
T2-3	1881	6.8.84	2T1881ED(R) (3,10,21)	1831	1.8.84	4 CON.PTS ON ST.SET	1831	1.8.84	T2A,T2B T6A,T6B	1831	1.8.84	SS1A-SS1D	1831	1.8.84	SC1 SC2
	1889	5.8.84	2T1889EA(F) (0.1,0.5,	1910	8.8.84	4 CON.PTS IN ROCK			T7A,T7B T12A,T12B			SS2A-SS2D			SC3 SC4
			1.2,1.5,1.8,2.9,						T13A,T13B T18A,T18B			SS3A-SS3D			SC5 SC6
	1889	5.8.84	2T1889EB(F) (0.1,0.4,0.9,						T19A,T19B T24A,T24B			SS4A-SS4D			(SC7)+ SC8
			1.5,1.9,2.3, 3.7,4.8,5.7)									SS5A-SS5D	+SC7 WAS REMOVED BECAUSE RING BEAM WAS TOO TIGHT		
	1889	5.8.84	2T1889EC(F) (0.1,0.5,0.9,									SS6A-SS6D			
			1.5,1.7,2.5, 4.8,5.2)												

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TABLE 7-6.1

ROCK SUPPORT INTERACTION STUDY AT DONKIN
SUMMARY OF INSTRUMENTATION IN TUNNEL 2
(ARRAY T2-4 - CH. 3353-3385 m)

INSTR. ARRAY	INSTRUMENTS														
	MPBXS			CONVERGENCE POINTS			VW STRAIN GAUGES ON THRUST BLOCKS			VW STRAIN GAUGES ON STEEL SETS			VW PRESSURE CELLS		
	Chainage (m)	Date*	Ref. No/ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes
T2-4	3385	4.12.84	2T3385EA(E) (0.1,0.4, 0.8,1.3, 1.8,2.8, 3.7,4.7, 5.6)							3353	1.12.84	SS1A-SS1D	3353	1.12.84	SC1 SC2 SC3 SC4 SC5 SC6 SC7 SC8
												SS2A-SS2D			
												SS4A-SS4D			
												SS5A-SS5D			
												SS6A-SS6D			

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TABLE I-6.1

ROCK SUPPORT INTERACTION STUDY AT DONKIN
SUMMARY OF INSTRUMENTATION IN TUNNEL 2
(SINGLE EXTENSOMETER STATIONS)

INSTR. ARRAY	INSTRUMENTS														
	MPBXS			CONVERGENCE POINTS			VW STRAIN GAUGES ON THRUST BLOCKS			VW STRAIN GAUGES ON STEEL SETS			VW PRESSURE CELLS		
	Chainage (m)	Date*	Ref. No/ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes
	2263	10.9.84	2T2263EA(F) (0.1,0.6,1.0), 1.5,1.8,3.0, 3.8,4.9,5.9, 7.2)												
	2433	27.9.84	2T2433EA(F) (0.1.0.3, 0.9,1.4,1.8, 2.8,3.8, 4.7,5.8)												
	2749	24.10.84	2T2749EA(F) (0.1,0.4, 0.9,1.4,1.9, 2.7,3.8,4.7, 5.7,7.0)												
	2996	8.11.84	2T2996EA(F) (0.1,0.4, 0.8,1.3,1.7, 3.3,3.7,4.7, 5.6,6.5)												

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TABLE I-6.1
ROCK SUPPORT INTERACTION STUDY AT DONKIN
SUMMARY OF INSTRUMENTATION IN TUNNEL 2
(SINGLE EXTENSOMETER STATIONS)

INSTR. ARRAY	INSTRUMENTS														
	MPBXS			CONVERGENCE POINTS			VW STRAIN GAUGES ON THRUST BLOCKS			VW STRAIN GAUGES ON STEEL SETS			VW PRESSURE CELLS		
	Chainage (m)	Date*	Ref. No/ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes
	3205	22.11.84	2T3205EA(F) (0.15,1.0, 1.4,1.9, 2.9,3.8, 4.9,5.7, 6.8)												
	3457	10.12.84	2T3457EA(F) (0.15,0.4, 0.8,1.3, 1.7,2.8, 3.5,4.6, 5.5,6.6)												
	3522	18.12.84	2T3522EA(F) (0.15,0.6, 0.9,1.5, 1.8,2.9, 3.8,4.9, 5.3)												
	3575	21.12.84	2T3575EA(F) (0.15,0.5, 0.9,1.4, 1.8,2.3)												

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TABLE I-6.1

ROCK SUPPORT INTERACTION STUDY AT DONKIN
SUMMARY OF INSTRUMENTATION IN TUNNEL 3

INSTR. ARRAY	INSTRUMENTS														
	MPBXS			CONVERGENCE POINTS			VW STRAIN GAUGES ON THRUST BLOCKS			VW STRAIN GAUGES ON STEEL SETS			VW PRESSURE CELLS		
	Chainage (m)	Date*	Ref. No/ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes	Chainage (m)	Date*	Ref. No./ Notes
T3-1	800	17.11.83	3T800EB(R	cross ho	le exten	someter (an	chors @ 21			from tunn	el 2		-	-	-
T3-2	900	17.11.83	3T900EB(R	cross ho	le exten	someter							-	-	-
T3-3	1105	8.11.83	3T1025EA(R) (3,10,21)	-	-	-	-	-	-	-	-	-	-	-	-
		3.11.83	3T1025EB(R) (3,10,21)												
		1.11.83	3T1025EC(R) (3,10,21)												
STRESS MEASUREMENT CH. 964 OVERCORING TESTS IN 100mm DIA. HOLE TO 20m, CARRIED OUT IN MAY 1983															

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TABLE I-6.2

LISTS OF INSTRUMENTS FOR TUNNEL RESEARCH PROGRAM

INSTRUMENT	DESCRIPTION
MPBX's (Extensometer)	Two types of MPBX's were used: a. Irad Gage Sonic probe (rigid probe) multiple-point extensometers generally with 3 anchors with deepest one at 21m. Resolution ± 0.002 in. (0.05 mm). Readout unit MB-7 (intrinsically safe for use in coal mines). b. Irad Gage Sonic probe (flexible probe) multiple-point extensometers generally, with 10 anchors with deepest one at 7.6 m. Resolution ± 0.002 in. (0.05mm). Readout unit MB-7.
STRAIN GAUGES	Irad Gage Model SM2W weldable vibrating wire strain gauges welded on steel set with spot welder. Sensor for gauge either spot welded or epoxied. Gauges read with MB-6LU readout unit (intrinsically safe for use in coal mines). Maximum strain range of gauge is 2500 microstrain units.
PRESSURE CELLS	Two types of Irad Gage vibrating wire pressure cells were used: a. Curved pressure cell model EPC-500: max. pressure range 500 psi (3.5 MPa), sensitivity 0.5 psi (3.5 kPa), custom made to 0.9 m x 0.15 m x 6.3 mm thick to fit profile of ring beam. b. Square pressure cell model EPC-1000: max. pressure range 1,000 psi (7 MPa), and 2,000 psi (14 MPa), sensitivity 1 psi (7 kPa) custom made to 0.15 m x 0.15 m x 6.3 mm thick to fit between butt joints of ring beam. Pressure cells read with MB-6LU readout unit.
CONVERGENCE POINTS	Stainless steel ball attached to steel set or 0.3 m anchors epoxied in rock. Readout unit: SINCO tape extensometer model 51855.

TABLE I-7.1

SUMMARY OF RESULTS OF INSITU STRESS MEASUREMENT
IN TUNNEL NO. 3 - CH. 964 m

TEST NO.	DEPTH FROM HOLE COLLAR (m)	STRESS COMPONENTS ON A PLANE PERPENDICULAR TO DRILLHOLE AXIS (see notes)		STRESS COMPONENT PERPENDICULAR TO TUNNEL AXIS
		σ_x (MPa)	σ_z (MPa)	σ_y (MPa)
USBM 1	3.89	3.52	4.77	-
CSIRO 1	5.54	2.60	3.35	2.48
CSIRO 2	8.93	7.84	5.46	9.04
USBM 2	9.71	8.38	5.55	-
USBM 3	16.39	8.23	3.84	-
USBM 4	19.00	7.26	5.03	-

AVERAGE MEASURED VERTICAL STRESS (σ_z) COMPONENTS FROM CSIRO 2, and USBM 2 to 4 = 4.9 MPa (std. dev.=0.8 MPa)

Vertical static stress (σ_v) based on weight of rock = 4.2 MPa

AVERAGE MEASURED HORIZONTAL STRESS:	MPa σ_x	σ_y
Distance within 6 m of tunnel wall	3.06 (2 tests)	2.48 (1 test)
Distance between 6 m and 19 m from tunnel wall	7.93 (4 tests)	9.04 (1 test)

NOTES:

(1) σ_x and σ_z are stress components on a plane perpendicular to the drillhole axis.
(2) σ_x is the horizontal stress component along the direction of the tunnel axis (Az. of tunnel axis = 15° east of north)
(3) σ_z is the vertical stress component
(4) σ_y is the horizontal stress component along the axis of the borehole (perpendicular to tunnel axis).

TABLE I-7.2

CALIBRATION OF THRUST BLOCK

STRAIN MEASUREMENT

Applied Load* (Tons)	(kN)	Strain Gauge T2A (ε_a) Loading	Unloading	Strain Gauge T2B (ε_b) Loading	Unloading
0	0	1679	-	1940	-
12	(106)	1559	-	1580	-
20	(178)	1474	-	1419	-
25	(222)	1431	-	1337	-
30	(267)	1396	-	1275	-
35	(312)	1336	-	1164	-
37	(329)	-	-	-	-
40	(350)	1239	-	1016	-
45	(400)	1177	-	922	-
50	(445)	1148	-	885	-
45	(400)	-	1171	-	939
40	(350)	-	1248	-	1064
37	(329)	-	1294	-	1134
30	(267)	-	1376	-	1268
25	(222)	-	1426	-	1349
0	0	-	1679	-	1935

* Thrust block calibrated using a 150 T capacity press at CBDC shop.

The formula for calculating the load from the strains ε_a and ε_b is as follows:

$$P = 2aEt\ (\varepsilon_a + \varepsilon_b) \qquad \text{(see section 7.4)}$$

$$E = \frac{P}{2at\ [\varepsilon_a + \varepsilon_b]}$$

For the case of loading between 12 to 50 tons (106 to 445 kN)

a = 93.73 mm (3.69 in) (centre distance between top and bottom plate of HSS)

t = 7.87 mm (0.31 in) (thickness of HSS section)

ε_a = 411 microstrain

ε_b = 695 microstrain

E = 208 GPa (30.1 x 10^6 psi)

This agrees very well with the rated deformation modulus of the steel for the thrust block.

NOTES: 1 Ton = 2000 lbs = 8.90 kN

TABLE I-7.3

INSITU DEFORMATION MODULUS WITH DEPTH FOR ALL BOREHOLES

DEPTH FROM BOREHOLE COLLAR (m)	INSITU DEFORMATION MODULUS (GPa)		
	BOREHOLE 3T-803	BOREHOLE 3T-805	BOREHOLE 2T-805
0.25	-	-	27.39
0.50	7.44	-	25.76
0.75	9.45	-	25.95
1.00	10.22	-	24.67
1.25	8.98	-	20.86
1.50	10.26	-	14.11
1.75	10.83	-	21.13
2.00	9.70	-	24.16
2.25	10.26	-	28.19
2.50	9.70	-	19.72
2.75	9.95	-	19.60
3.0	10.00	-	15.18
3.25	10.50	-	11.99
3.50	11.60	-	11.85
3.75	11.39	-	10.98
4.00	11.65	-	11.36
4.25	10.93	-	11.50
4.50	11.87	-	11.09
4.75	11.80	-	10.53
5.0	11.64	-	10.92
5.50	11.60	10.45	11.11
6.00	18.11	36.68	10.82
6.5	-	26.30	9.90
7.00	19.63	23.76	10.18
7.5	24.69	22.89	11.04
7.97	18.32	-	-
8.00	-	18.76	10.61
8.5	-	9.92	10.42
9.00	-	-	9.08
9.5	-	-	10.57
10.00	-	-	10.61
10.5	-	-	9.79
11.00	-	-	8.89
11.5	-	-	9.87
12.00	-	-	9.95
12.5	-	-	9.64
13.00	-	-	8.78
13.5	-	-	9.78
14.00	-	-	9.80
14.5	-	-	10.00
15.00	-	-	9.70

NOTE: Refer to Figure I-5.1 for Borehole positions

TABLE I-7.4

SEISMIC VELOCITIES
FOR TUNNEL NO. 2

Spread 201, (400 m Station)

Shot	Primary (V_p) (m/s)	Shot	Shear (V_s) (m/s)
10	3780	50	2040
			2630*
40	3850	20,30	1950
	3850		
60	2980*	70,80	1560

Average V_p = 3830 ± 33 (standard deviation)

Average V_s = 1850 ± 208

Spread 202, (610 m Station)

Shot	Primary (V_p) (m/s)	Shot	Shear (V_s) (m/s)
10	3600	50	1400*
			1430*
40	(3870?)*	20,30	2060
	3850		
60	3320	70,80	1840

Average V_p = 3590 ± 216

Average V_s = 1950 ± 110

Spread 203, (810 m Station)

Shot	Primary (V_p) (m/s)	Shot	Shear (V_s) (m/s)
10 (average)	4050	50	2500*
			2610*
40	3950	20,30	2180
	3160*		
60	4450		
80	4640	70,80	2380

Average V_p = 4270 ± 283

Average V_s = 2280 ± 100

*not used in average

TABLE I-7.5

SEISMIC VELOCITIES
FOR TUNNEL NO. 3

Spread 301, (400 m Station)

Shot	Primary (V_p) (m/s)	Shot	Shear (V_s) (m/s)
10	3330	20,30	1430
40	3000	70,80	1240
	2670*		
60	2850		

Average V_p = 3060 ± 200 (standard deviation)

Average V_s = 1335 ± 95

Spread 302, (640 m Station)

Shot	Primary (V_p) (m/s)	Shot	Shear (V_s) (m/s)
10	3730	20,30	1570
40	3540	70,80	1790
	3000		
60	4680*		

Average V_p = 3420 ± 309

Average V_s = 1680 ± 110

Spread 303, (810 m Station)

Shot	Primary (V_p) (m/s)	Shot	Shear (V_s) (m/s)
40	3700	20,30	2220
	3560		
60	3780	50	2270
			2180
		70,80	2380

Average V_p = 3680 ± 91

Average V_s = 2260 ± 78

*not used in average

TABLE 1-7.6

CROSS-TUNNEL TRAVEL TIMES

Spread 213, Station 810 m

Geophone	X Distance along tunnel from first geophone (m)	Y Time of first arrival (ms)
1	0	9.1
2	2	-
3	4	9.3
4	6	9.5
5	7	9.5
6	8	9.5
7	9	9.6
8	10	9.7
9	11	9.7
10	16	10.2
11	21	10.5
12	26	11.4

TABLE I-7.7

SEISMIC VELOCITY AND DYNAMIC ELASTIC MODULI RELATIONSHIPS

V_p - P wave velocity

V_s - S wave velocity

E - Deformation modulus

ν - Poisson's ratio

d - Density

$$a = \frac{V_p}{V_s}$$

$$V_p = \left[\frac{E(1-\nu)}{d(1+\nu)\ (1-2\nu)}\right] 1/2$$

$$V_s = \left[\frac{E}{2d(1+\nu)}\right] 1/2$$

$$\nu = \frac{(V_p/V_s)^2-2}{2(V_p/V_s)^2-1}$$

$$E = dV_p^{\ 2}\frac{(1+\nu)(1-2\nu)}{(1-\nu)}$$

$$= 2dV_s^{\ 2}(1+\nu)$$

TABLE I-7.8

DYNAMIC ELASTIC MODULI

Tunnel No. 2 Chainage	Primary (V_p) (m/s)	Shear (V_s) (m/s)	Poisson's Ratio (ν)	Deformation Modulus (GPa)
400 m	3830	1850	0.35	23
610 m	3590	1950	0.29	24
810 m	4270	2280	0.30	34
Tunnel No. 3 Chainage				
400 m	3060	1330	0.38	12
640 m	3420	1680	0.34	19
810 m	3680	2260	0.20	30

TABLE I-7.9

LAYER VELOCITIES

Primary Wave (V_p) in Tunnel No. 2 (m/s)

Geophone Interval	Spread Station 201/400 m	202/610 m	203/810 m
1-3	1790	1780	1950
2-7		3000?	3240
5-12	4000	3700	4690

TABLE 4-9.10

SUMMARY OF RESULTS OF UNIAXIAL COMPRESSION TESTS

SAMPLE LOCATION	ROCK TYPE	COMPRESSIVE STRENGTH (MPa)				ELASTIC MODULUS (GPa)				POISSON'S RATIO				REMARKS
		MEAN	STAN.DEV.	RANGE	NO. OF SAMPLES	MEAN	STAN.DEV.	RANGE	NO. OF SAMPLES	MEAN	STAN.DEV.	RANGE	NO. OF SAMPLES	
CROSS HOLE EXT. 3T800EB(R)	I	79.1	18.7	44.9-99.5	15	21	3.1	13.8 - 27.5	15	.24	.046	.18-.32	12	the last 3 samples were not considered for Poisson's Ratio
CROSS HOLE EXT. 3T900EB(R)	I	82.6	18.9	63.4-122.4	12	24.1	4.6	19.1-36.1	12	.23	.034	.18-.28	12	
CROSS HOLE 3T804	I	98.5	14.8	68.6-141.2	10	31.2	5.5	25.7-43.7	10	.25	.047	.17-.38	10	
T3-3 ch.1025m	I	114.9	18.5	84.5-145.1	11	20.6	2.2	17.0-24.8	11	.15	.04	.09-.20	10	
T3-3 ch.1025m	II	121.3	40.1	47.9-152.8	6	17.6	4.4	6.6-21.9	6	.14	.04	.11-.16	2	one sample tested in uniaxial compression contained a through-going discontinuity
T3-3 ch.1025m	III	30.3	9.8	13.9-39.1	5	4.6	0.1	4.5-4.8	4	-	-	-	-	
T3-3 ch.1025m	IV	38.1	17.7	14.7-62.9	5	10.2	4.1	5.8-15.0	4	-	-	-	-	
T3-3 ch.1025m	V	37.2	4.1	30.9-42.2	5	11.5	4.9	8.8-15.0	2	-	-	-	-	
T2-2 ch.1420m	III	55.6	14.2	29.7-68.5	7	7.1	1.5	4.2-8.4	7	-	-	-	-	
T2-2 ch.1420m	IV	24.3	-	-	1	4.0	-	-	1	-	-	-	-	
ch.2471	III	74.3	4.0	68.6-89.7	5	22.4	1.4	17.2-25.3	5	0.2	.05	.14-.22	5	

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TABLE I-7.11

SUMMARY OF RESULTS OF BRAZILIAN (TENSILE) TESTS

Sample Location	Rock Type	Tensile Strength (MPa) Mean	Stan. Dev.	Range	No. of Samples
ch. 1025 m	I	7.5	1.2	5.6-9.5	20
	II	9.0	2.2	4.7-11.9	10
	III	3.5	1.0	1.9-4.9	10
	IV	3.7	1.3	2.3-6.3	10
	V	3.5	1.5	1.5-6.0	9

TABLE I-7.12

SUMMARY OF RESULTS OF TRIAXIAL TESTS

SAMPLES FROM TUNNEL NO. 2, CH. 1881 m

ROCK TYPE III

TRIAXIAL TEST

σ_3 (MPa)	σ_1 (MPa)	E (MPa)
0	20.0	5700
1	51.3	
2	36.6	
3	53.5	
4	76.6	

ROCK TYPE II

TRIAXIAL TEST

σ_3 (MPa)	σ_1 (MPa)	E (MPa)
0	19.7	4000
0	24.9	6400
1	35.3	
2	30.7	
3	69.7	
4	82.2	
5	100.6	
5	65.4	
6	69.7	

σ_1 = Axial stress

σ_3 = confining stress

E = modulus of Elasticity

TABLE I-7.13

SUMMARY OF STRENGTH AND DEFORMATION PROPERTIES OF DIFFERENT ROCK TYPES

ROCK TYPE[1]	UNIAXIAL COMPRESSIVE STRENGTH σ_c (MPa)		TENSILE STRENGTH σ_T (MPa)		DEFORMATION MODULUS E (GPa)		POISSON'S RATIO ν	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
I	44.9-145.1	93.8	5.6-9.6	7.5	13.8-43.7	34.2	0.17-0.38	0.25
II	47.9-152.8	121.3	4.7-11.9	9.0	6.6-21.9	17.6	-	-
III	13.9-68.5	53.6	1.9-4.9	3.5	4.5-25.3	11.3	-	-
IV	14.7-62.9	35.8	2.3-6.3	3.7	4-15.0	9.0	-	-
V	30.9-42.2	37.2	1.5-6.0	3.5	8.8-15.0	11.5	-	-

NOTES:

(1) Refer to Figure I-4.1 for description of rock types.

TABLE I-7.14

SAMPLES FROM STRATA CONTROL HOLES
SELECTED FOR MINERALOGY TESTS

BORHOLE	CHAINAGE (m)	ROCK TYPE	DEPTH	LENGTH OF SAMPLE (m)
2	1517.93	I	5.23 - 5.40	0.17
		I	16.76 - 16.95	0.19
3	1689.95	II	2.91 - 3.06	0.15
		III	4.92 - 5.10	0.18
		II	7.16 - 7.31	0.15
		V	13.81 - 13.97	0.16
		IV	28.23 - 28.44	0.21
4	1881.38	V	6.50 - 6.69	0.19
5	2259.35	I	17.35 - 17.61	0.26
		V	32.91 - 33.14	0.23
		V	35.87 - 36.11	0.24
6	2471.06	III	5.96 - 6.13	0.17
		I	17.73 - 17.92	0.19
7	2617.08	V	6.36 - 6.54	0.18
		II	7.99 - 8.11	0.12
		III	11.13 - 11.27	0.14

TABLE I-7.15

DESCRIPTION OF SAMPLES FOR CHEMICAL AND X-RAY DIFFRACTION ANALYSES

Sample		Description[1] (Macroscopic and Microscopic)
Borehole No.	Depth (m)	
3	13.81-13.97	Medium grey, hard mudstone or shale. Breaks into irregular chunks having curved, highly polished surfaces. Occasional partings at ~ 60° dip. **Under binocular scope:** Polished surfaces seem curved and multidirectional. No visible reaction to dilute HCℓ even when powdered. Harder than thumb nail but easily cut with knife. Very fine grained with few grains large enough to see.
4	6.50-6.69	Same as BH 3, 13.81-13.97 m. Parting surfaces at ~ 14° and ~ 30° dips assuming vertical hole. **Under binocular scope:** Same as BH 3, 13.81-13.97 m except that thin coatings on fracture surfaces react very weakly to dilute HCℓ.
5	32.91-33.14	Medium grey, hard mudstone or shale with numerous irregular polished joint surfaces. **Under binocular scope:** Slightly more crystalline or coarser grained than above two samples. Few intact surface patches react with dilute HCℓ. Powdered rock reacts vigorously with HCℓ. Rock seems to disperse readily in tap water.
5	35.87-36.11	Dark, reddish brown mudstone easily cleaved at 35° dip. Cleavage planes or partings more planar and with less polish. **Under binocular scope:** Very finely crystalline, massive, no visible reaction to dilute HCℓ.

contd.../

TABLE I-7.15 (cont'd)

DESCRIPTION OF SAMPLES FOR CHEMICAL AND X-RAY DIFFRACTION ANALYSES

Sample		Description (Macroscopic and Microscopic)
Borehole No.	Depth (m)	
7	6.36-6.54	Dark grey, hard mudstone or shale with very irregular, curved, multi-directional, highly polished cleavage planes. Under binocular scope: Very finely crystalline, no visible reaction to dilute HCℓ or 30% H_2O_2.

(1) Core samples were wrapped as follows:

BH 3 (13.81-13.97 m) - wrapped in aluminum foil
BH 4 (6.50-6.69 m) - wrapped in Saran wrap and foil
BH 5 (32.91-33.14 m) - wrapped in damp tissue and two layers of foil
BH 5 (35.87-36.11 m) - wrapped in damp tissue and one layer of foil
BH 7 (6.36-6.54 m) - wrapped in damp tissue and one layer of foil

TABLE I-7.16

SUMMARY OF CHEMICAL ANALYSES

Sample		(1) Carbonate	(2) Soluble Salts	(3) Chlorides	(4) pH
Borehole No.	Depth (m)	(%)	(mg/g)	(mg/g)	
3	13.81-13.97	- 5	0.96	0.61	9.0
4	6.50-6.69	- 3	1.45	0.60	9.1
5	32.91-33.14	- 19	0.55	0.04	9.2
5	35.87-36.11	-3.5	0.95	0.13	9.3
7	6.36-6.54	- 2	0.38	0.06	9.0

Notes:

(1) By gasometric methods

(2) By conductivity meter on soil:water mixtures of 1:5, reference NaCℓ standard

(3) By chloride ion electrode on soluble salt samples

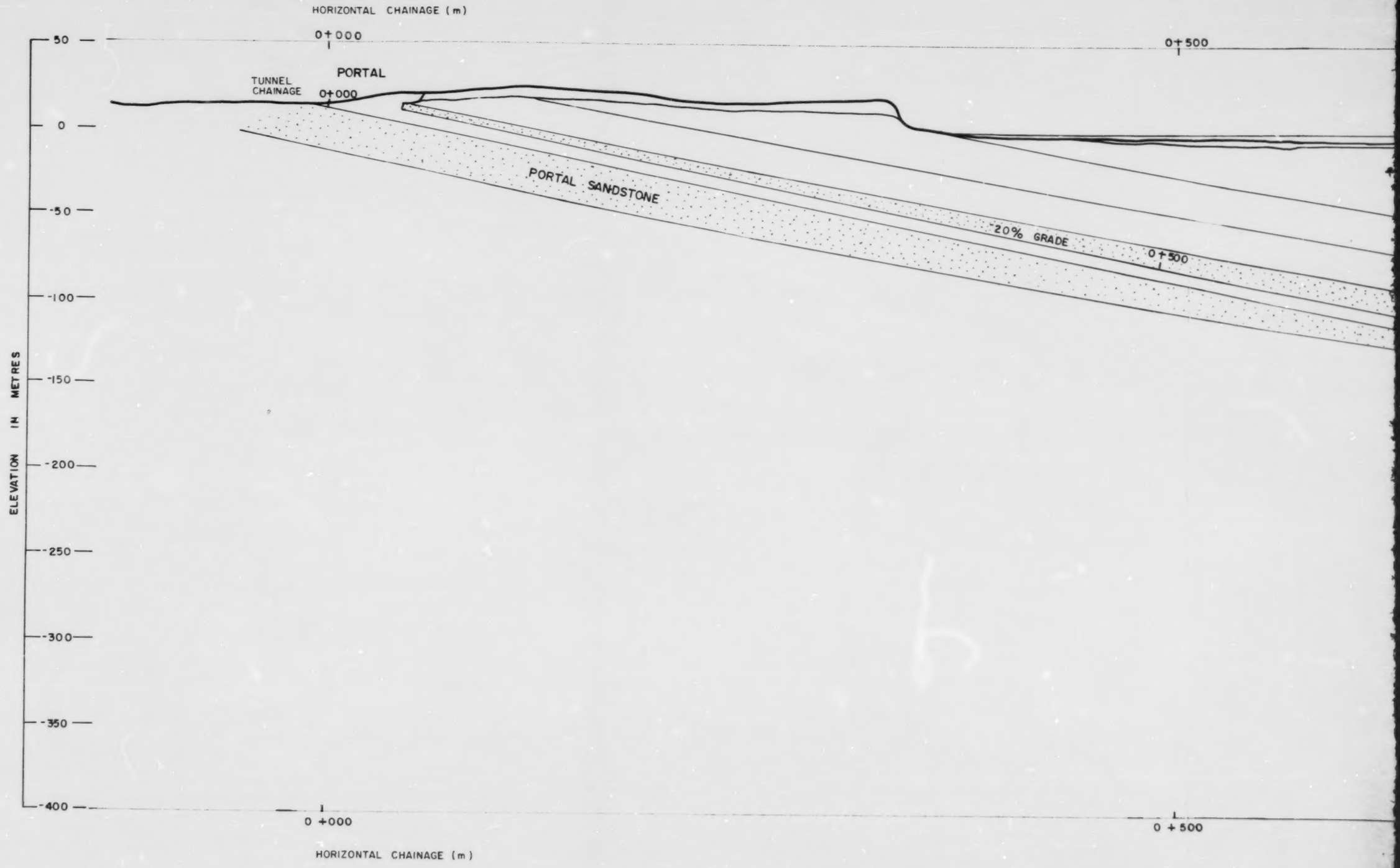
(4) By pH electrode on soluble salt samples

TABLE I-7.17

SUMMARY OF SHORE SCLEROSCOPE TESTS

REFERENCE NO.	ROCK TYPE	SAMPLE DEPTH	HARDNESS (shore) AXIAL	CIRCUMFERENTIAL
2-1-1	I	5.23 - 5.40 m	49	49
2-1-2			52	49
2-2-1	I	16.76 - 16.95 m	49	48
2-2-2			51	49
3-1-1	II	2.91 - 3.06 m	52	51
3-1-2			53	51
3-2-1	III	4.92 - 5.10 m	50	48
3-2-2			51	49
3-3-1	II	7.16 - 7.31 m	52	50
3-3-2			52	50
3-5	IV	28.23 - 28.44 m		35
5-1-1	I	17.35 - 17.61 m	50	49
			49	47
6-1	III	5.96 - 6.13 m		31
6-2-1	I	17.73 - 17.92 m	49	49
6-2-2			52	49
7-2	II	7.99 - 8.11 m	52	50
7-3	III	11.13 - 11.27 m		30

NOTES: Reference No. (2-1-1) indicates Borehole No.- Sample - Test No. For sample source see Table I-7.14.


HORIZONTAL CHAINAGE (m)
0+000
0+500
TUNNEL CHAINAGE
PORTAL
0+000
50
0
-50
-100
-150
-200
-250
-300
-350
-400
ELEVATION IN METRES
PORTAL SANDSTONE
20% GRADE
0+500
0 +000
0 + 500
HORIZONTAL CHAINAGE (m)

0+500

1+000

GRADE

0+500

0+750

-10% GRADE

1+000

PHALEN SEAM

EMERY SEAM

McRURY SEAM

III

PORTAL SAN

0 + 500

1 + 000

1+500

2+000

ATLANTIC OCEAN

PHALEN SEAM

BACKPIT SEAM

BOUTHILLIER S

III

III

I

1+500

II

-1.07% GRADE

IV-V

III

II

2+000

V

II-III

I-II

IV-V

PORTAL SANDSTONE

1+500

2+000

2+000

2+500

AN

BOUTHILLIER SEAM

HARBOUR SEAM

II

II-III

III - IV

V

II-III

V

III

2+500 I

I-II-IV

II-III-IV

III -II-I

III

V

2+000

I-II

IV-V

II -III

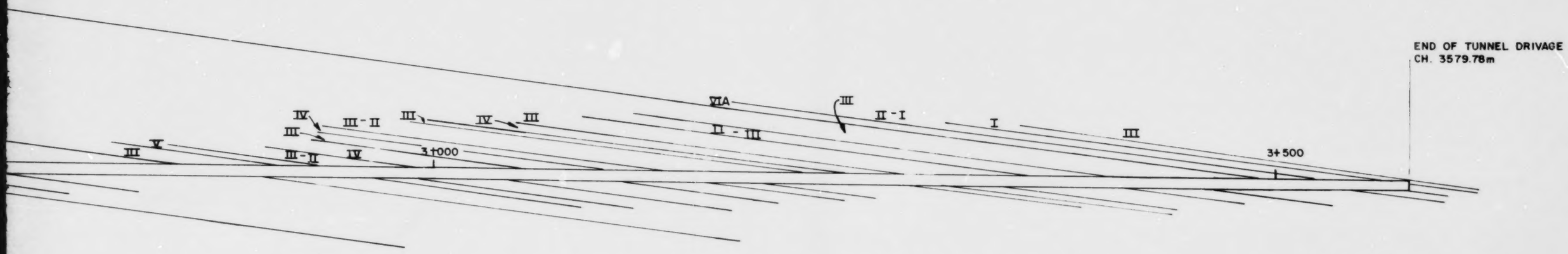
III - IV

2+000

2+500

3 + 000

3 + 500

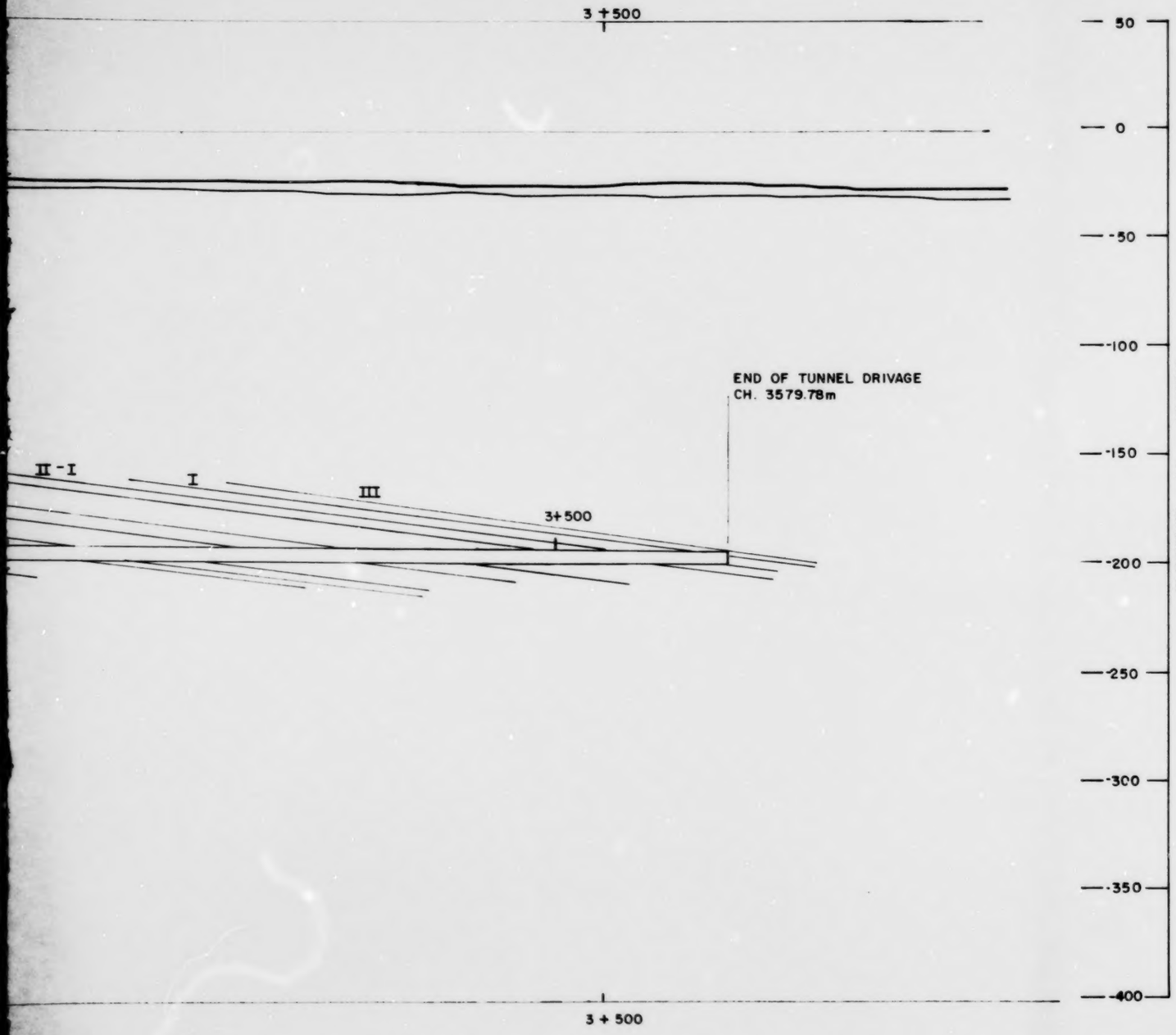


3 + 000

3 + 500

GEOLOGICAL SECTION ALONG TUNNEL No. 2

FIGURE I-4.1



LITHOLOGICAL LEGEND FOR TUNNEL STRATIGRAPHY

ROCK TYPE	LITHOLOGICAL DESCRIPTION
I	SANDSTONE, FRESH TO SLIGHTLY WEATHERED, LAMINATED TO THICKLY BEDDED, LIGHT GREY FINE TO COARSE GRAINED
II	INTERBEDDED SANDSTONE / SILTSTONE, FRESH TO SLIGHTLY WEATHERED, LAMINATED TO THICKLY BEDDED, LIGHT TO DARK GREY ARGILLACEOUS SILTSTONE AND FINE GRAINED SANDSTONE FREQUENTLY INTERLAMINATED, AND OR GRADATIONALLY BEDDED.
III	SILTSTONE, FRESH TO SLIGHTLY WEATHERED, LAMINATED TO THICKLY BEDDED, LIGHT TO DARK GREY ARGILLACEOUS TO FINE GRAINED SANDY SILTSTONE WITH OCCASIONAL IRONSTONE NODULES.
IV	INTERBEDDED SILTSTONE / MUDSTONE, FRESH TO SLIGHTLY WEATHERED, LAMINATED TO THICKLY BEDDED, LIGHT TO DARK GREY MUDSTONE AND SANDY SILTSTONE, FREQUENTLY INTER-LAMINATED AND / OR GRADATIONALLY BEDDED, MUDSTONE FREQUENTLY FISSILE.
V	MUDSTONE, FRESH TO SLIGHTLY WEATHERED, THINLY LAMINATED TO MEDIUM BEDDED, LIGHT TO DARK GREY MUDSTONE FREQUENTLY FISSILE.
VI	CARBONACEOUS MUDSTONE, FRESH TO SLIGHTLY WEATHERED, THINLY LAMINATED TO MEDIUM BEDDED, DARK GREY TO BLACK MUDSTONE CONTAINING CLASTS OR INTERBEDS OF BLACK CARBONACEOUS MUDSTONE AND / OR THINLY LAMINATED COAL.
VI A	COAL, FRESH TO FAINTLY WEATHERED, LAMINATED TO THINLY BEDDED, BRIGHT BLACK CLEATED COAL, CONTAINS MINOR MUDSTONE AND CLAY PARTINGS.

SCALE 1:2000

Date JUNE, 1985
Project 831-6014

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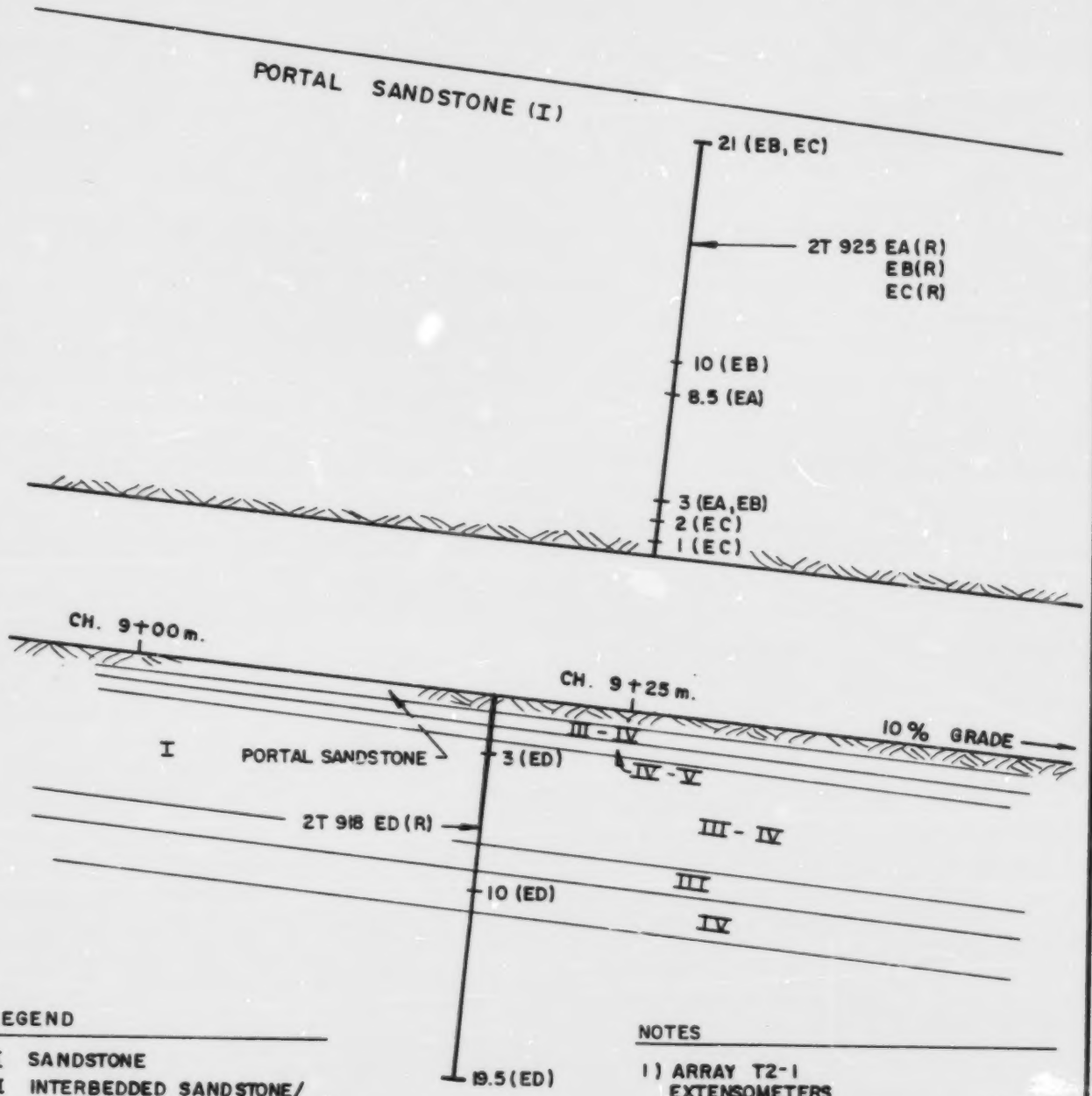
Chkd

GEOLOGY AT INSTRUMENTED STATION ARRAY T2-1
EXTENSOMETER ARRAY

FIGURE I-4.2



LEGEND

- I SANDSTONE
- II INTERBEDDED SANDSTONE/ SILTSTONE
- III SILTSTONE
- IV INTERBEDDED SILTSTONE / MUDSTONE
- V MUDSTONE
- VI CARBONACEOUS MUDSTONE
- VIA COAL

NOTES

1) ARRAY T2-1 EXTENSOMETERS
   - 2T 925 EA (R) 3, 8.5 m.
   - 2T 925 EB (R) 3, 10, 21 m. PROJECTED
   - 2T 925 EC (R) 1, 2, 21 m. " "
   - 2T 918 ED (R) 3, 10, 19.5 m. " "

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 6.0°

SCALE 1:300

Date NOV. 20, 1984
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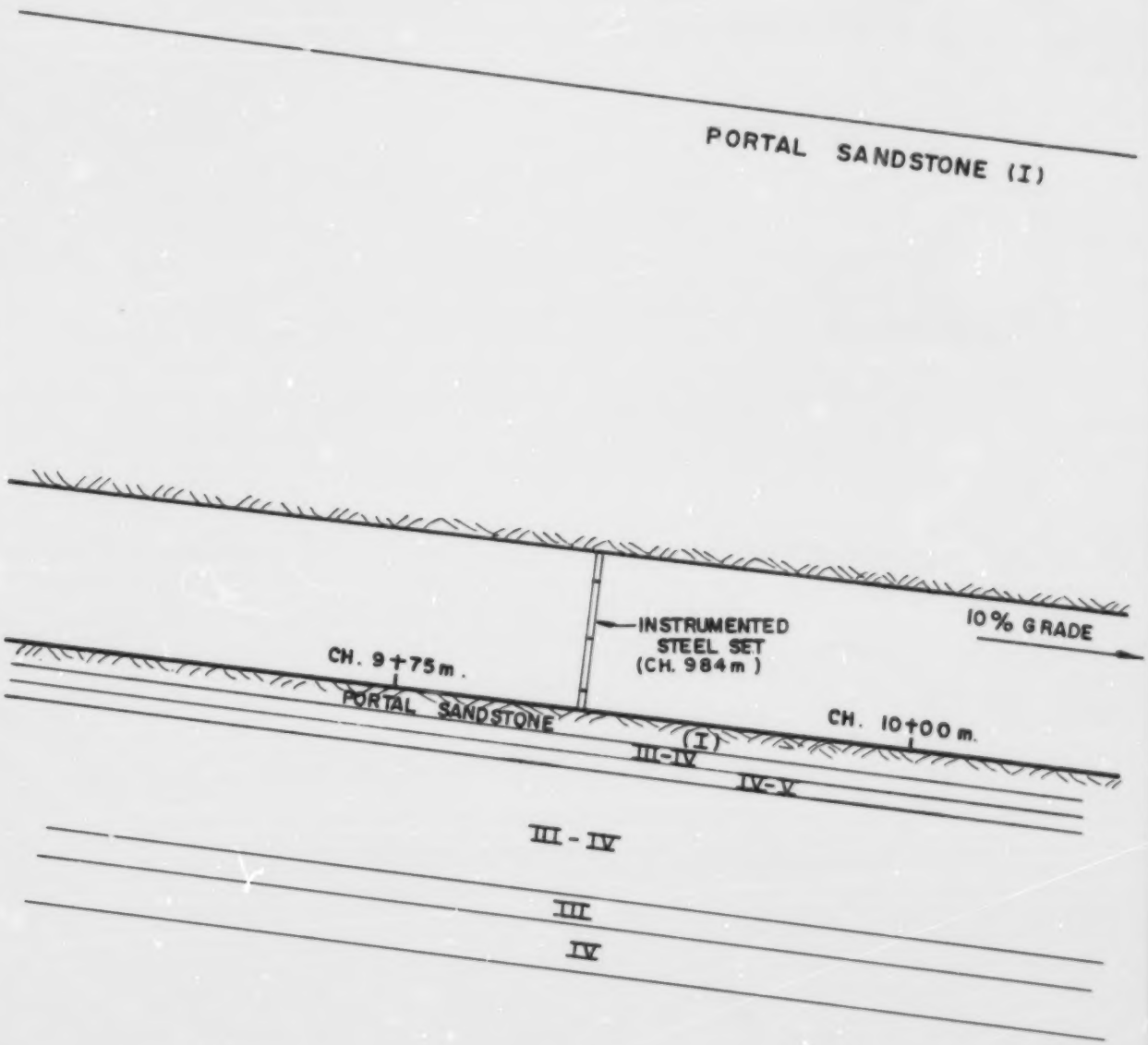
Chkd.

Form G.A.-D-4 (M)

GEOLOGY AT INSTRUMENTED STATION ARRAY T2-1 (INSTRUMENTED STEEL SET)

FIGURE I-4.3



LEGEND

- I SANDSTONE
- II INTERBEDDED SANDSTONE/ SILTSTONE
- III SILTSTONE
- IV INTERBEDDED SILTSTONE/MUDSTONE
- V MUDSTONE
- VI CARBONACEOUS MUDSTONE
- VIA COAL

NOTES

1.) ARRAY T2-1 INSTRUMENTED STEEL SET CH. 9+84m.

2.) LOCAL APPARENT DIP OF STRATA ALONG THE TUNNEL ALIGNMENT 6.0°

SCALE 1:300

Date NOV. 21, 1984

Project 831-6014

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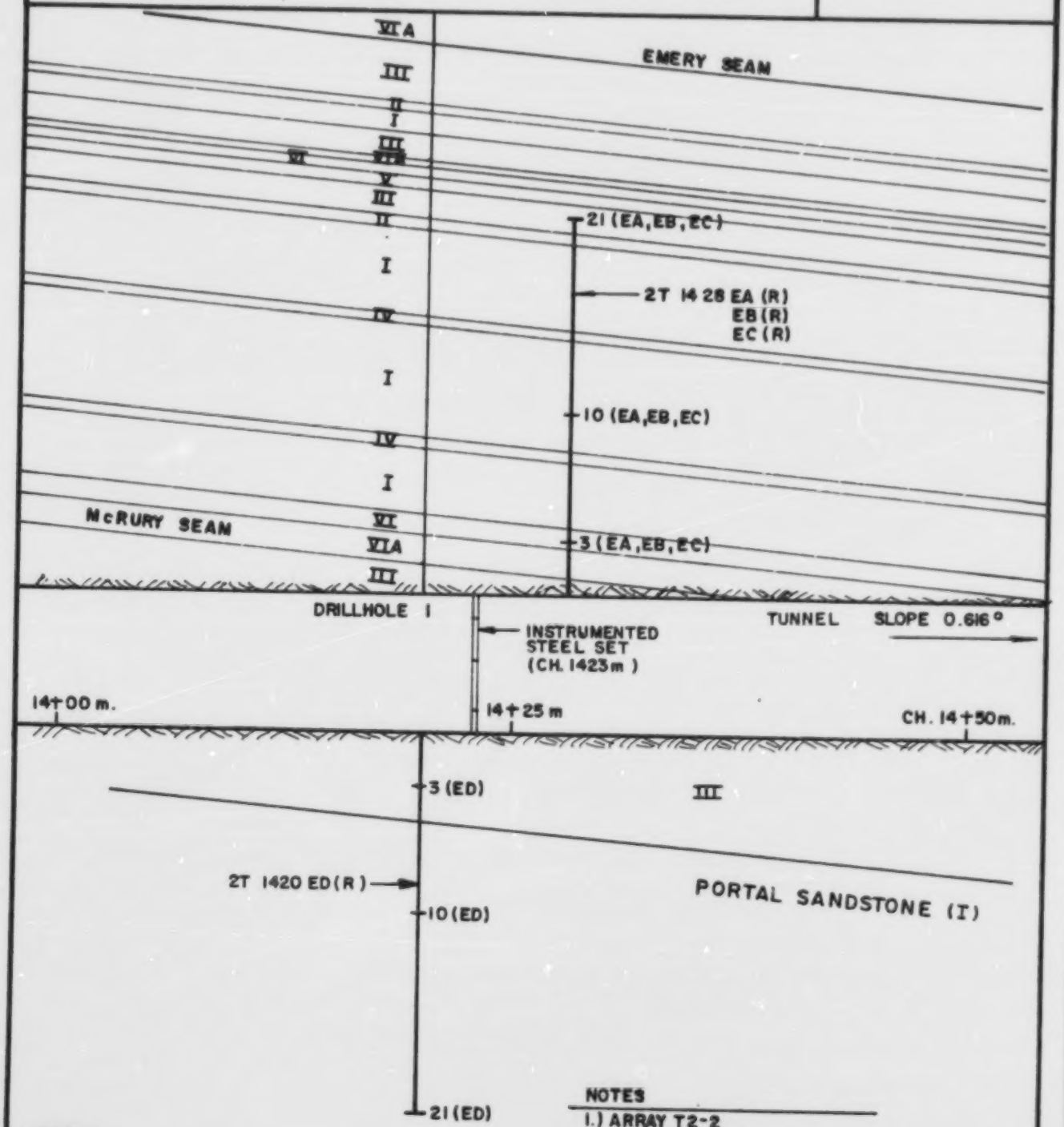
Chkd.

Form G.A.-D.-4 (M)

GEOLOGY AT INSTRUMENTED STATION ARRAY T2-2 (INSTRUMENTED STEEL SET)

FIGURE I-4.4



LEGEND

- I SANDSTONE
- II INTERBEDDED SANDSTONE/SILTSTONE
- III SILTSTONE
- IV INTERBEDDED SILTSTONE/MUDSTONE
- V MUDSTONE
- VI CARBONACEOUS MUDSTONE
- VIA COAL

NOTES

1.) ARRAY T2-2 EXTENSOMETERS

2T 1428 EA (R) 3, 10, 21 m.
2T 1428 EB (R) 3, 10, 21 m. (PROJECED
2T 1428 EC (R) 3, 10, 21 m. " "
2T 1420 ED (R) 3, 10, 21 m. " "

INSTRUMENTED STEEL SET CH. 1423m.

2) LOCAL APPARENT DIP OF STRATA ALONG THE TUNNEL ALIGNMENT 5.2°

SCALE 1:300

Date NOV. 21, 1984
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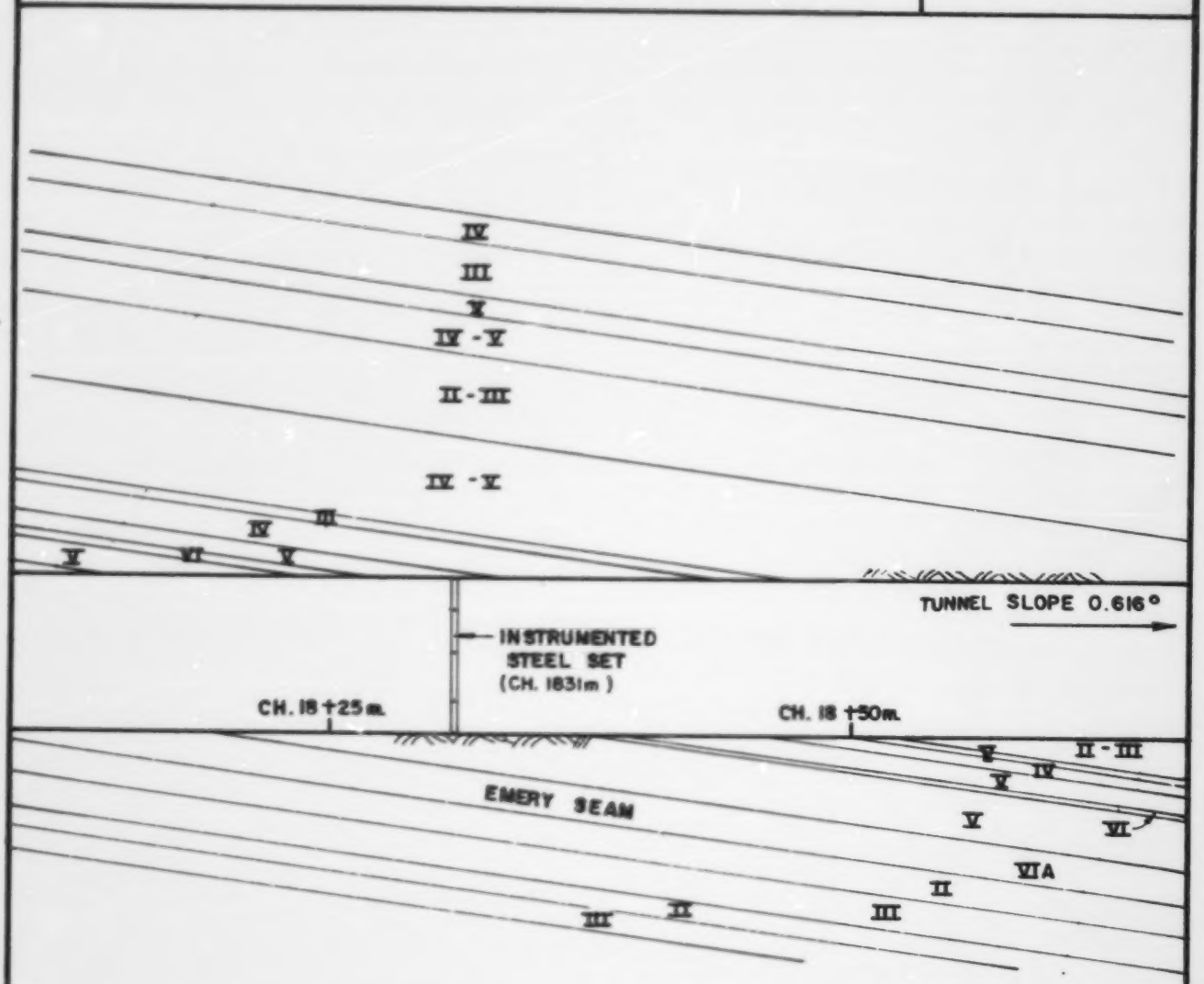
Chkd. GK

Form G.A.-D-4 (M)

GEOLOGY AT INSTRUMENTED STATION ARRAY T2-3 (INSTRUMENTED STEEL SET)

FIGURE I-4.5



LEGEND

I SANDSTONE
II INTERBEDDED SANDSTONE/SILTSTONE
III SILTSTONE
IV INTERBEDDED SILTSTONE/MUDSTONE
V MUDSTONE
VI CARBONACEOUS MUDSTONE
VIA COAL

NOTES

1.) ARRAY T2-3

INSTRUMENTED STEEL SET
CH. 18+31m.

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 7.7°

SCALE 1:300

Date NOV. 21, 1984
Project 831-6014

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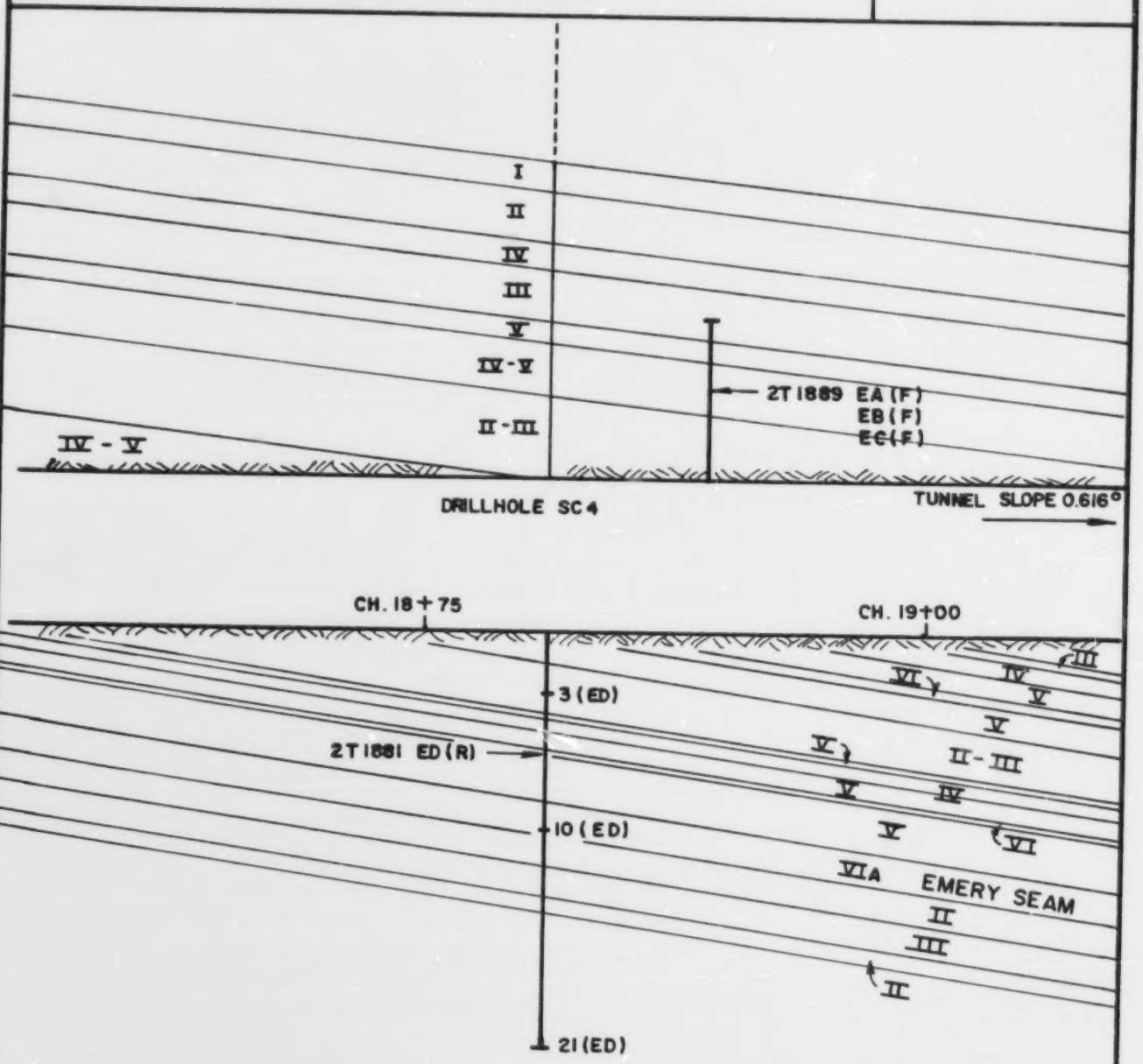
Chkd. CJ

Form G.A.-D.-4 (M)

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER ARRAY

FIGURE I-4.6



LEGEND

- I SANDSTONE
- II INTERBEDDED SANDSTONE/SILTSTONE
- III SILTSTONE
- IV INTERBEDDED SILTSTONE/MUDSTONE
- V MUDSTONE
- VI CARBONACEOUS MUDSTONE
- VIA COAL

NOTES

1) ARRAY T2-3 EXTENSOMETER
   2T 1889 EA (F), 2T 1889 EB (F), 2T 1889 EC (F) } REF. TO TABLE I-6.1 FOR POSITIONS OF ANCHORS
   2T 1881 ED (R) 3, 10, 21m. PROJECTED

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 6.8°

SCALE 1:300

Date NOV. 21, 1984

Project 831-6014

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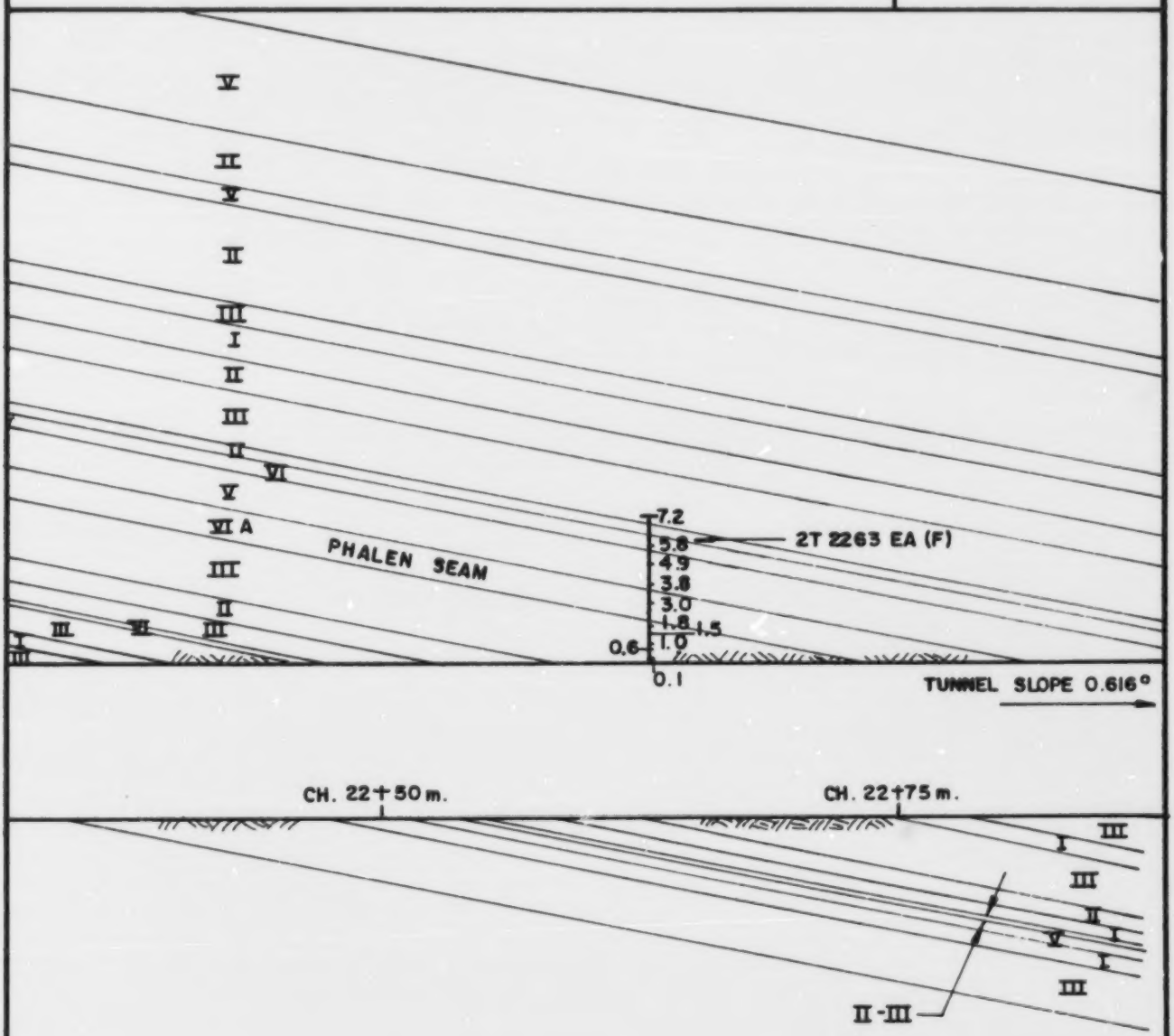
Chkd. CJ

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T2263EA(F)

FIGURE I-4.7



LEGEND

- I SANDSTONE
- II INTERBEDDED SANDSTONE/SILTSTONE
- III SILTSTONE
- IV INTERBEDDED SILTSTONE/MUDSTONE
- V MUDSTONE
- VI CARBONACEOUS MUDSTONE
- VIA COAL

NOTES

1) EXTENSOMETER 2T 2263 EA(F) 0.1, 0.6, 1.0, 1.5, 1.8, 3.0, 3.8, 4.9, 5.8, 7.2m.
2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 10.5°

SCALE 1:300

Date NOV. 21, 1984
Project 831-5014

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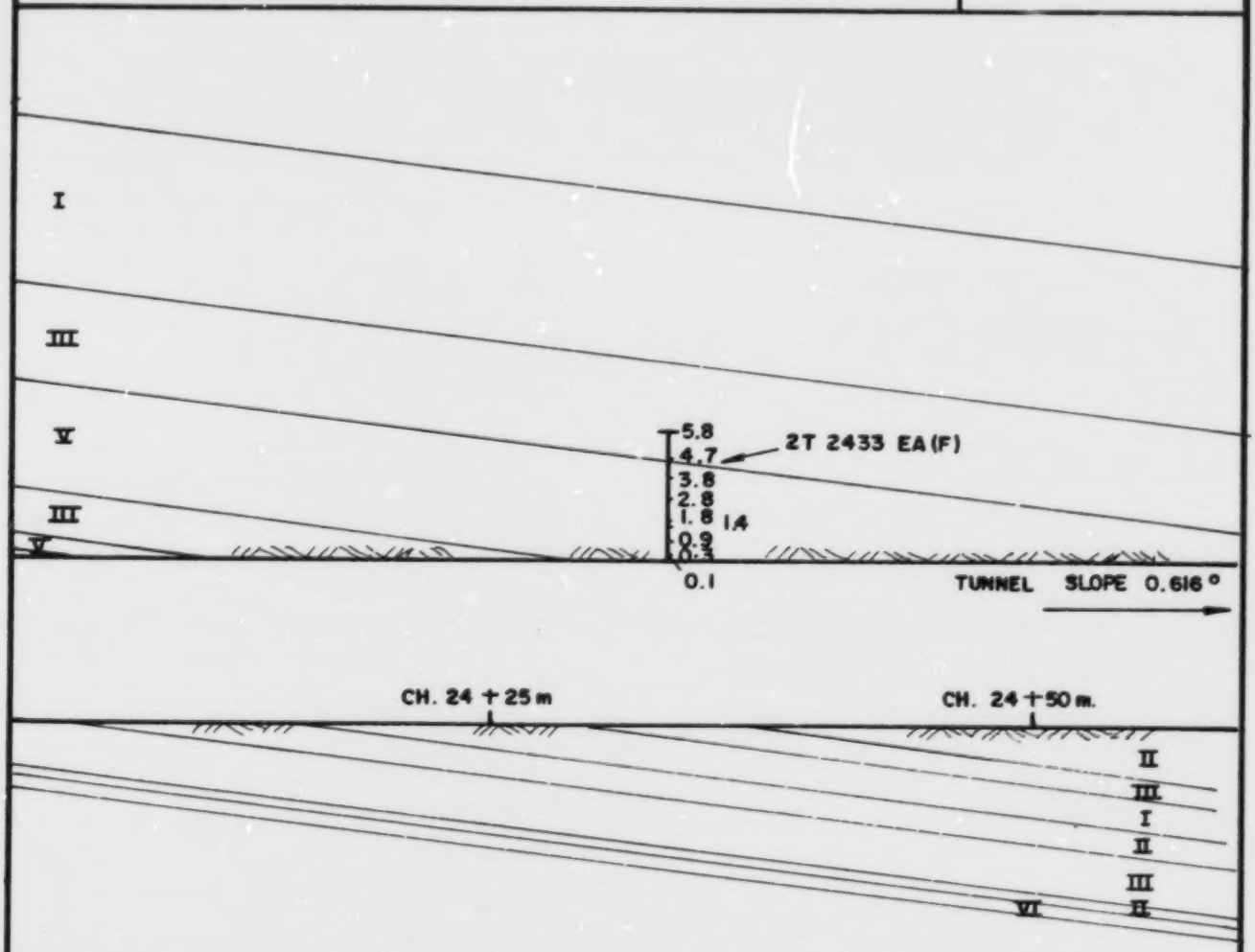
Chkd. GL

Form GA-D-4(N)

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T2433 EA(F)

FIGURE I-4.8



LEGEND

- I SANDSTONE
- II INTERBEDDED SANDSTONE/SILTSTONE
- III SILTSTONE
- IV INTERBEDDED SILTSTONE/MUDSTONE
- V MUDSTONE
- VI CARBONACEOUS MUDSTONE
- VIIA COAL

NOTES

1) EXTENSOMETER 2T2433 EA (F) 0.1, 0.3, 0.9, 1.4, 1.8, 2.8, 3.8, 4.7, 5.8
2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 7.3°

Date NOV. 21, 1984
Project 831-6014

SCALE 1:300

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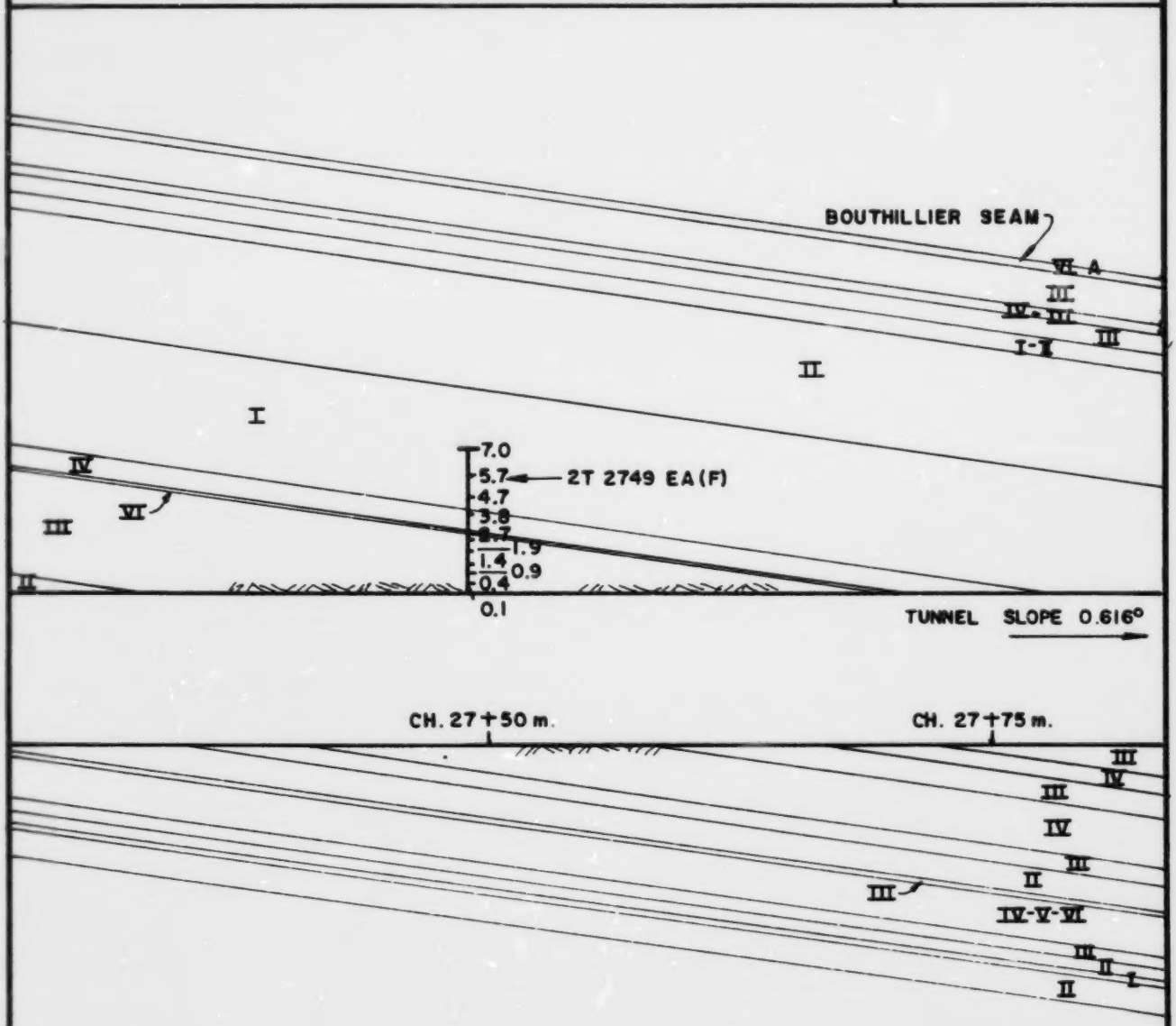
Chkd. CB

Form 8A-D-4 (M)

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T 2749 EA (F)

FIGURE I-4.9



LEGEND

- I SANDSTONE
- II INTERBEDDED SANDSTONE/SILTSTONE
- III SILTSTONE
- IV INTERBEDDED SILTSTONE/MUDSTONE
- V MUDSTONE
- VI CARBONACEOUS MUDSTONE
- VIA COAL

NOTES

1.) EXTENSOMETER 2T2749 EA(F) 0.1, 0.4, 0.9, 1.4, 1.9, 2.7, 3.8, 4.7, 5.7, 7.0 m.

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT: 8.4°

SCALE 1: 300

Date NOV. 21, 1984

Project 831-6014

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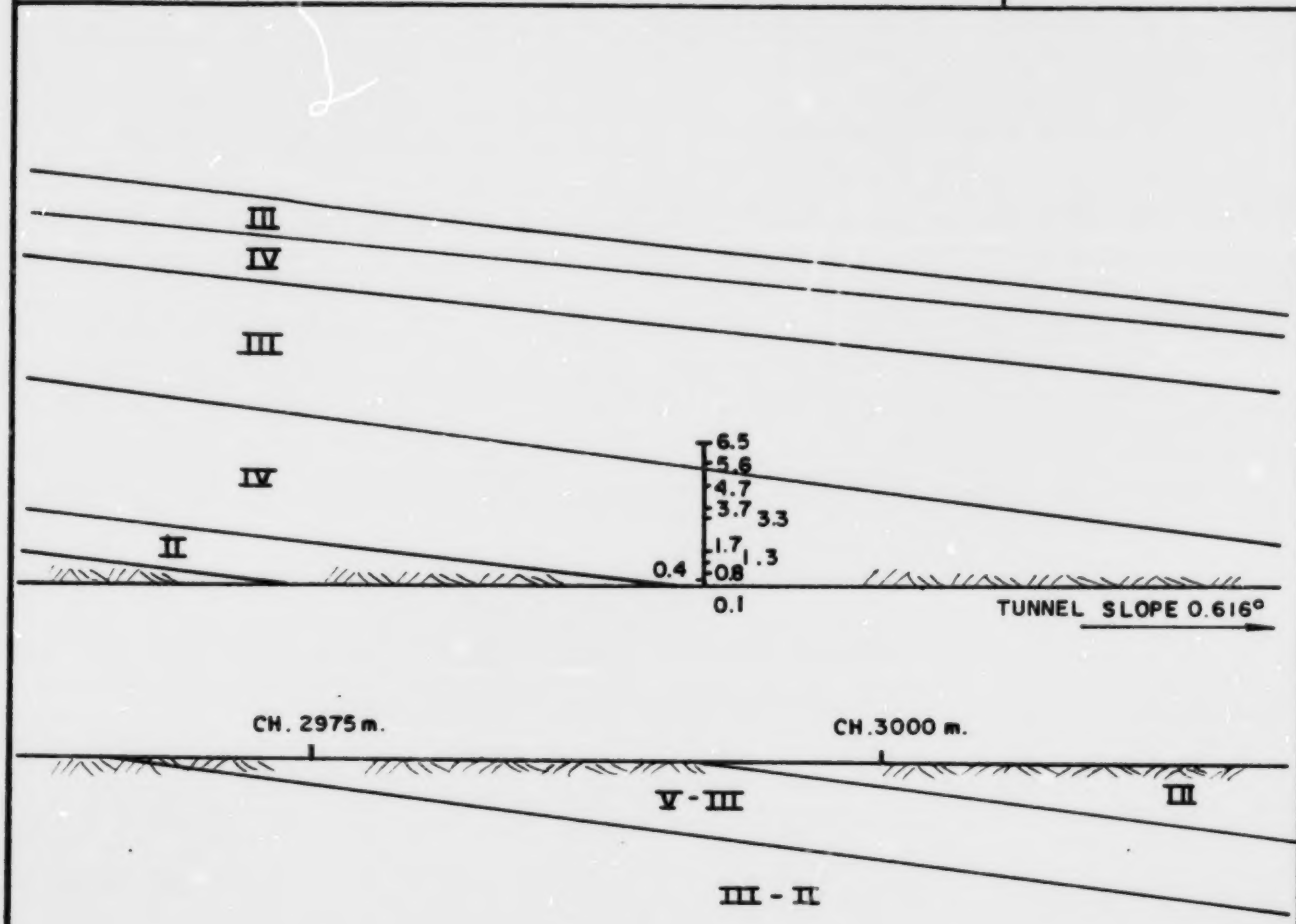
Chkd. [illegible]

Form GA-D-4(M)

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T2996 EA(F)

FIGURE I-4.10



LEGEND

I	SANDSTONE
II	INTERBEDDED SANDSTONE / SILTSTONE
III	SILTSTONE
IV	INTERBEDDED SILTSTONE/MUDSTONE
V	MUDSTONE
VI	CARBONACEOUS MUDSTONE
VIA	COAL

NOTES

1) EXTENSOMETER 2T 3457 EA (F) 0.15, 0.4, 0.8, 1.3, 1.7, 2.8, 3.5, 4.6, 5.5, 6.6

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 7°

SCALE 1:300

Date APRIL 18, 1985

Project 831-6014

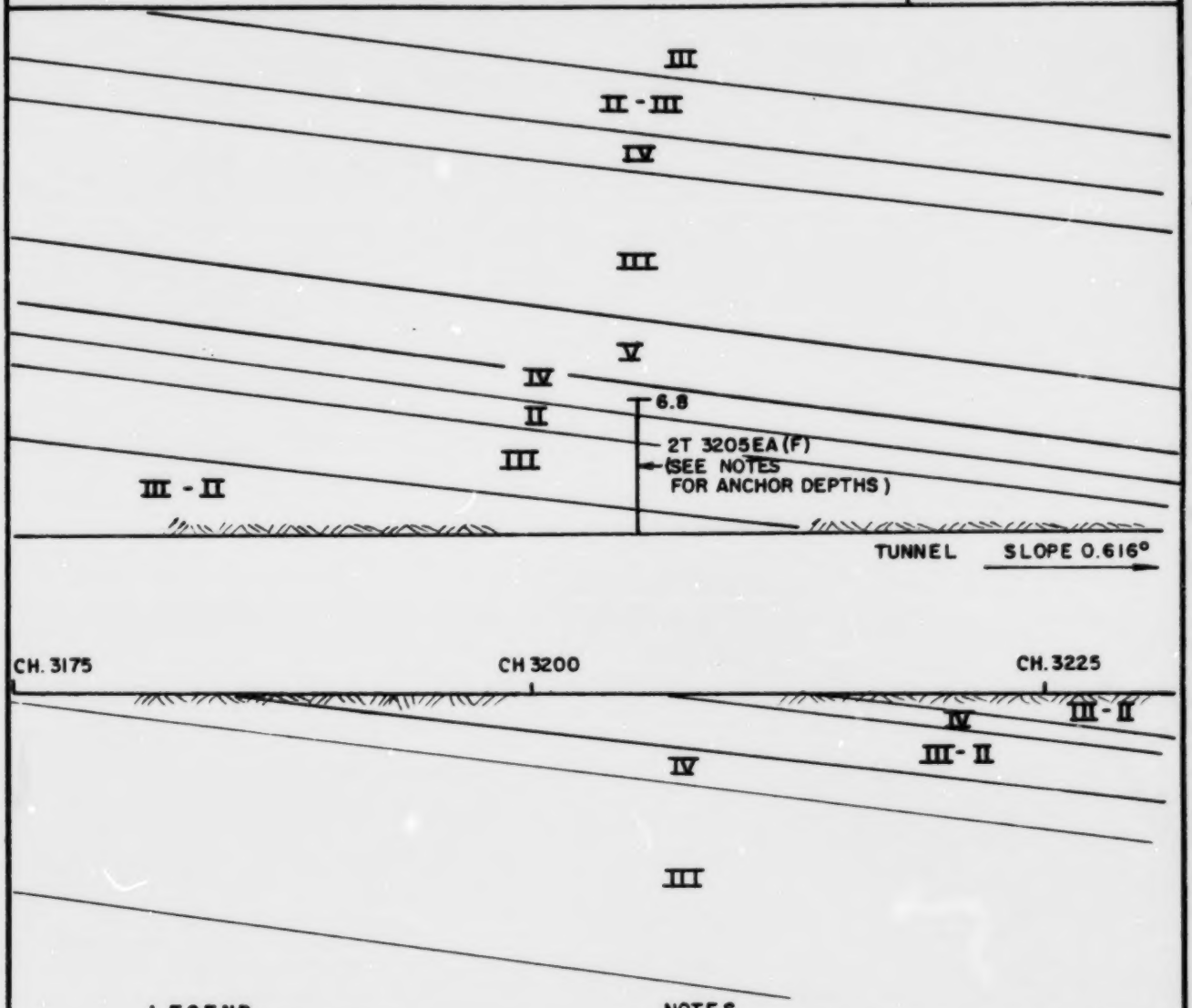
Golder Associates

Drawn D. M

Chkd. [illegible]

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T 3205 EA(F)

FIGURE I-4.11



LEGEND

I	SANDSTONE
II	INTERBEDDED SANDSTONE / SILTSTONE
III	SILTSTONE
IV	INTERBEDDED SILTSTONE/MUDSTONE
V	MUDSTONE
VI	CARBONACEOUS MUDSTONE
VIA	COAL

NOTES

1) EXTENSOMETER 2T 3205EA (F) 0.15, 0.5, 1.0 1.4, 1.9, 2.9, 3.8, 4.9, 5.7, 6.8

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 7.3°.

SCALE 1:300

Date APRIL 18, 1985

Project 831-6014

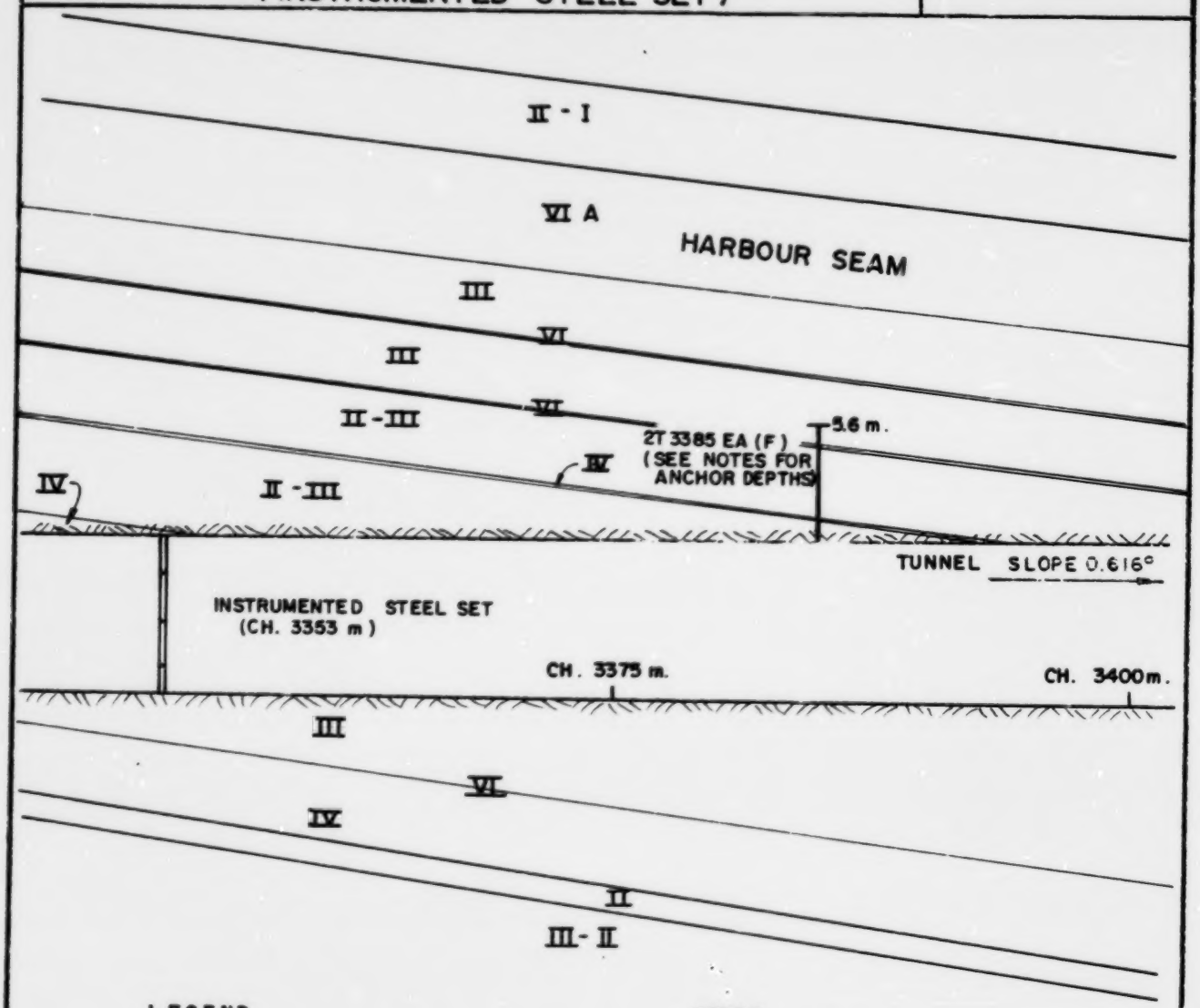
Golder Associates

Drawn D.M

Chkd. ____

GEOLOGY AT INSTRUMENTED STATION
ARRAY T2-4
(INSTRUMENTED STEEL SET)

FIGURE I-4.12



LEGEND

I	SANDSTONE
II	INTERBEDDED SANDSTONE / SILTSTONE
III	SILTSTONE
IV	INTERBEDDED SILTSTONE/MUDSTONE
V	MUDSTONE
VI	CARBONACEOUS MUDSTONE
VIA	COAL

NOTES

1) EXTENSOMETER 2T 3385 EA (F)
0.1m, 0.4, 0.8, 1.3, 1.8, 2.8, 3.7, 4.7, 5.6

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 8.5°

SCALE 1:300

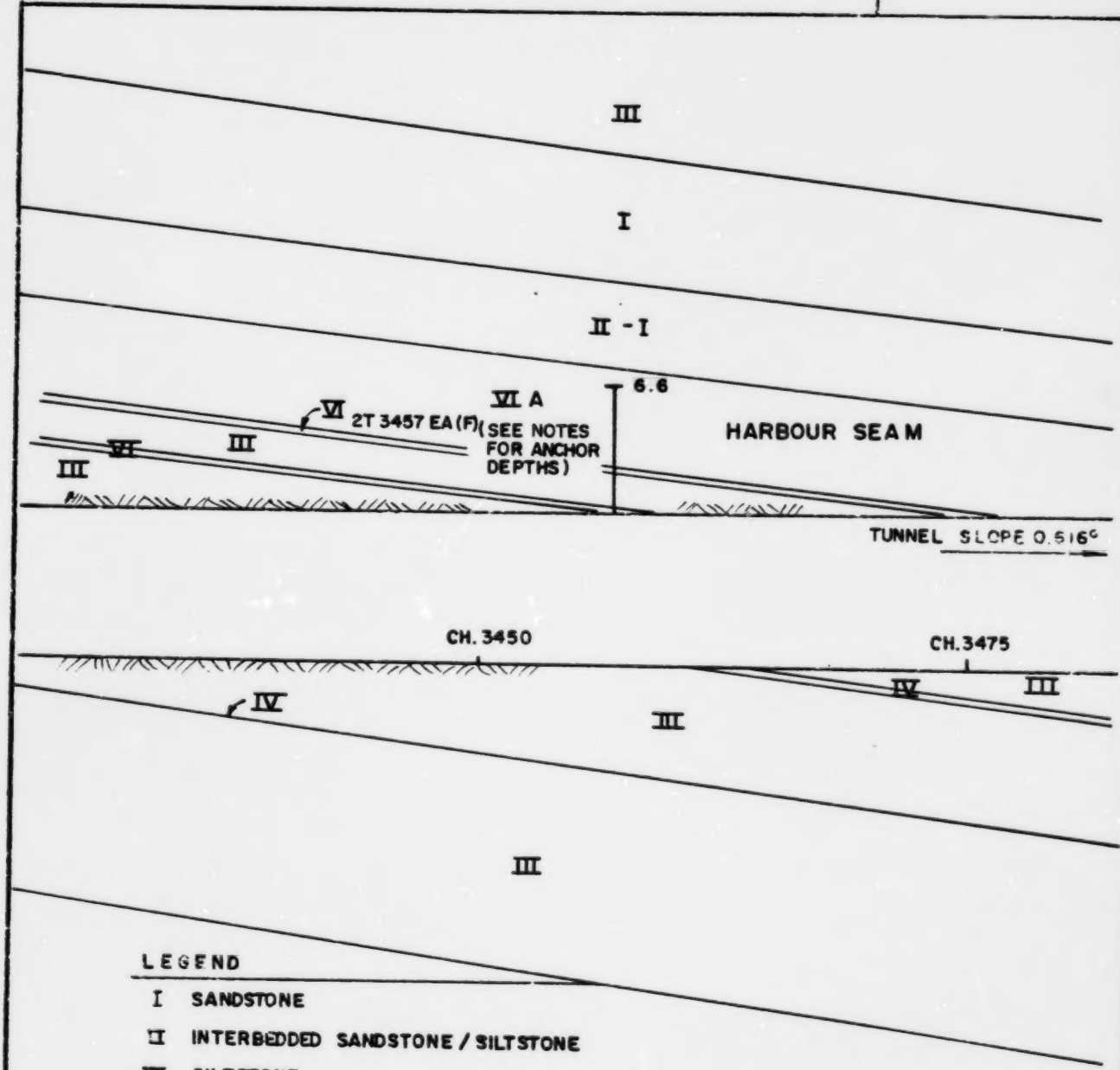
Date APRIL 18, 1985
Project 831-6014

Golder Associates

Drawn D.M
Chkd.

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T3457 EA(F)

FIGURE I-4.13



LEGEND

I	SANDSTONE
II	INTERBEDDED SANDSTONE / SILTSTONE
III	SILTSTONE
IV	INTERBEDDED SILTSTONE/MUDSTONE
V	MUDSTONE
VI	CARBONACEOUS MUDSTONE
VIA	COAL

NOTES

1) EXTENSOMETER 2T3457 EA (F) 0.15, 0.4, 0.8, 1.3, 1.7, 2.8, 3.5, 4.6, 5.5, 6.6

2) LOCAL APPARENT DIP OF STRATA AT TUNNEL ALIGNMENT 7.5°.

SCALE 1:300

Date APRIL 18, 1985

Project 831-6014

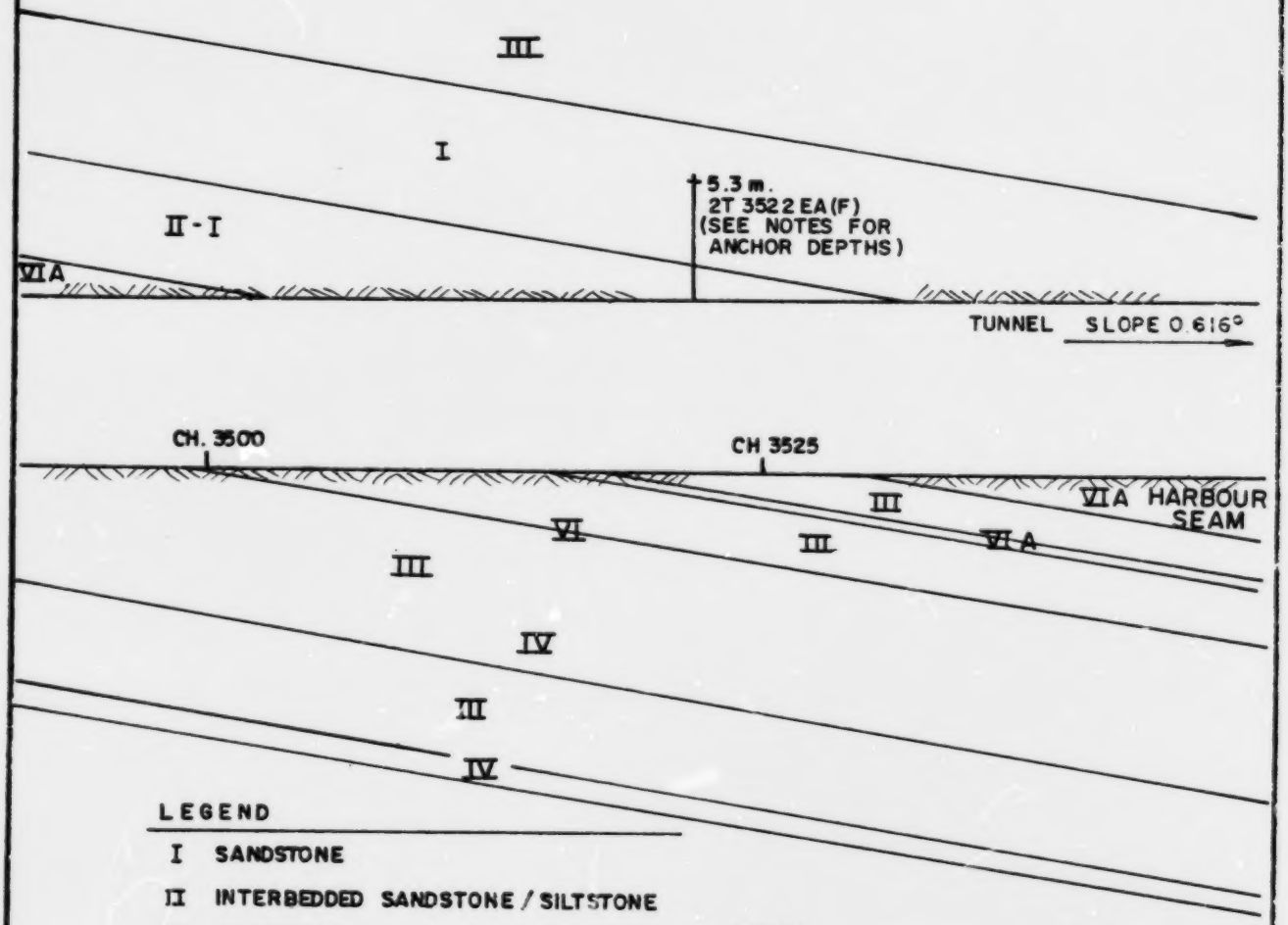
Golder Associates

Drawn D.M

Chkd. [illegible]

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T3522 EA(F)

FIGURE I-4.14



LEGEND

I	SANDSTONE
II	INTERBEDDED SANDSTONE / SILTSTONE
III	SILTSTONE
IV	INTERBEDDED SILTSTONE/MUDSTONE
V	MUDSTONE
VI	CARBONACEOUS MUDSTONE
VIA	COAL

NOTES

1) EXTENSOMETER 2T 3522 EA (F) 0.15, 0.6, 0.9, 1.5, 1.8, 2.9, 3.8, 4.9, 5.3

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 10.°

SCALE 1:300

Date APRIL 18, 1985

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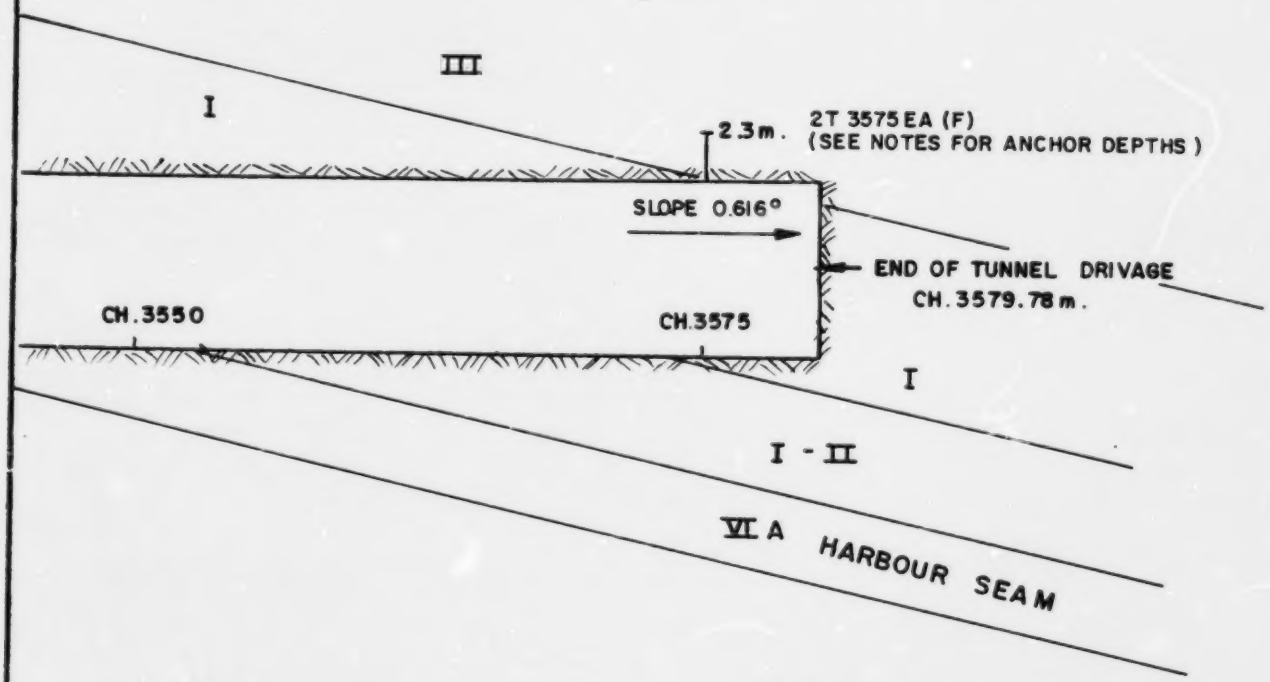
Chkd. GJC

GEOLOGY AT INSTRUMENTED STATION EXTENSOMETER 2T 3575 EA (F)

FIGURE I-4.15



LEGEND

I	SANDSTONE
II	INTERBEDDED SANDSTONE / SILTSTONE
III	SILTSTONE
IV	INTERBEDDED SILTSTONE/MUDSTONE
V	MUDSTONE
VI	CARBONACEOUS MUDSTONE
VIA	COAL

NOTES

1) EXTENSOMETER 2T 3575 EA (F) 0.15, 0.5, 0.9, 1.4, 1.8, 2.3

2) LOCAL APPARENT DIP OF STRATA ALONG TUNNEL ALIGNMENT 13°.

SCALE 1:300

Date APRIL 18, 1985

Project 831-6014

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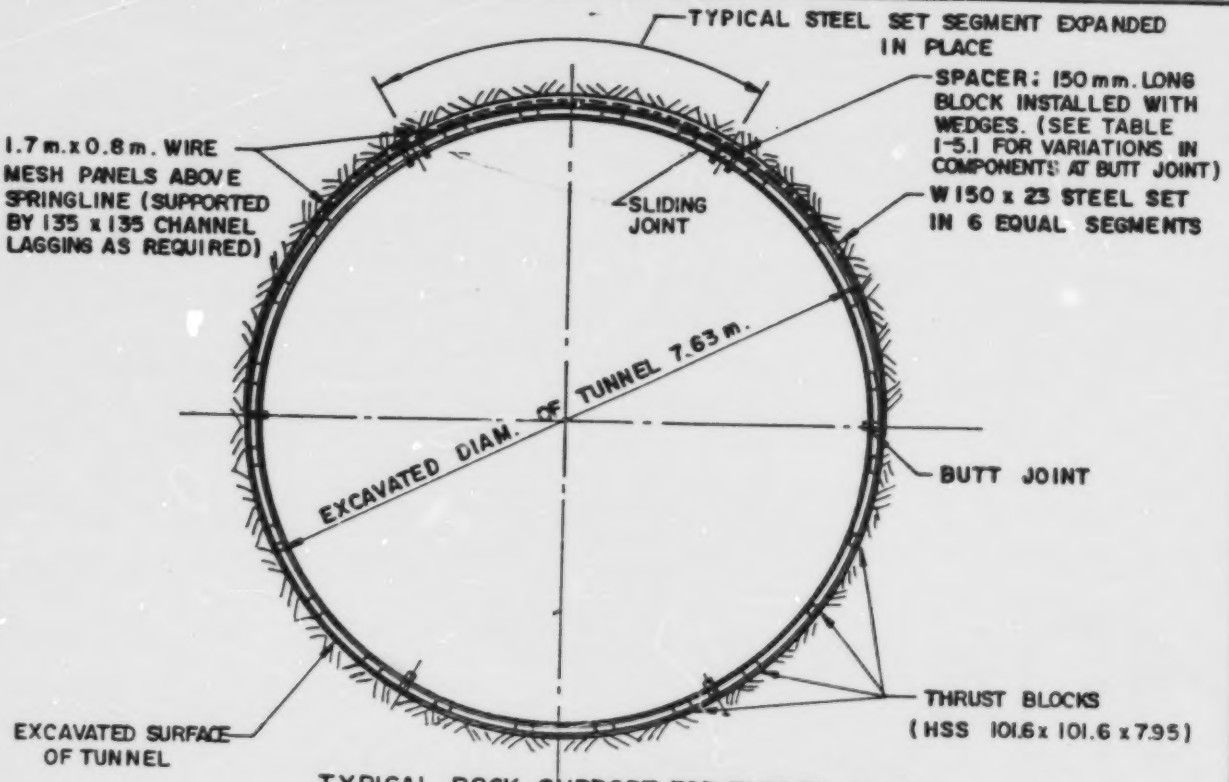
Drawn D.M

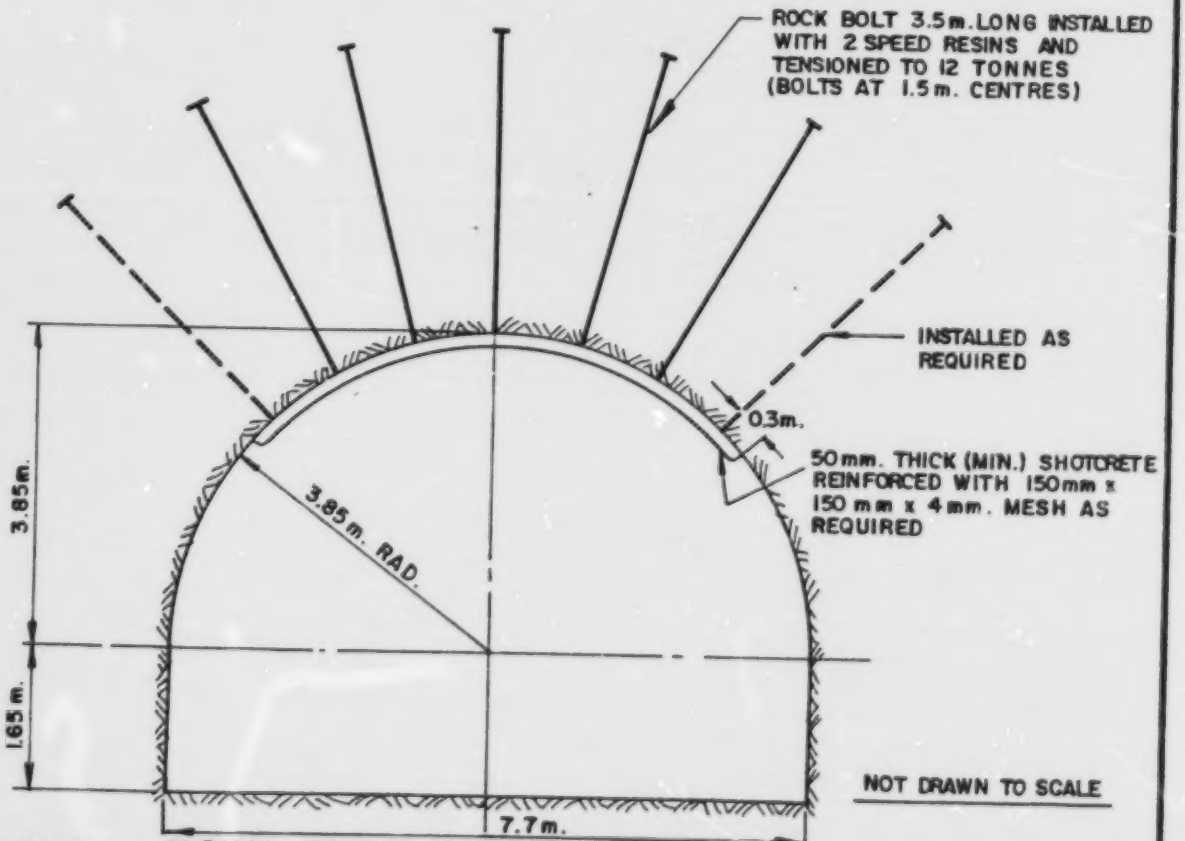
Chkd. [illegible]

ROCK SUPPORT SYSTEM FOR TUNNELS 2 AND 3

FIGURE I-5.2


TYPICAL STEEL SET SEGMENT EXPANDED IN PLACE
SPACER: 150 mm. LONG BLOCK INSTALLED WITH WEDGES. (SEE TABLE I-5.1 FOR VARIATIONS IN COMPONENTS AT BUTT JOINT)
W150 x 23 STEEL SET IN 6 EQUAL SEGMENTS
1.7 m. x 0.8 m. WIRE MESH PANELS ABOVE SPRINGLINE (SUPPORTED BY 135 x 135 CHANNEL LAGGINS AS REQUIRED)
SLIDING JOINT
EXCAVATED DIAM. OF TUNNEL 7.63 m.
BUTT JOINT
THRUST BLOCKS (HSS 101.6 x 101.6 x 7.95)
EXCAVATED SURFACE OF TUNNEL

TYPICAL ROCK SUPPORT FOR TUNNEL No. 2


ROCK BOLT 3.5 m. LONG INSTALLED WITH 2 SPEED RESINS AND TENSIONED TO 12 TONNES (BOLTS AT 1.5 m. CENTRES)
INSTALLED AS REQUIRED
0.3m.
50 mm. THICK (MIN.) SHOTCRETE REINFORCED WITH 150mm x 150 mm x 4 mm. MESH AS REQUIRED
3.85 m.
3.85 m. RAD.
1.65 m.
7.7 m.

NOT DRAWN TO SCALE

TYPICAL ROCK SUPPORT FOR TUNNEL No. 3

Date NOV. 23, 1984
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Chkd.

FIGURE I-5.3

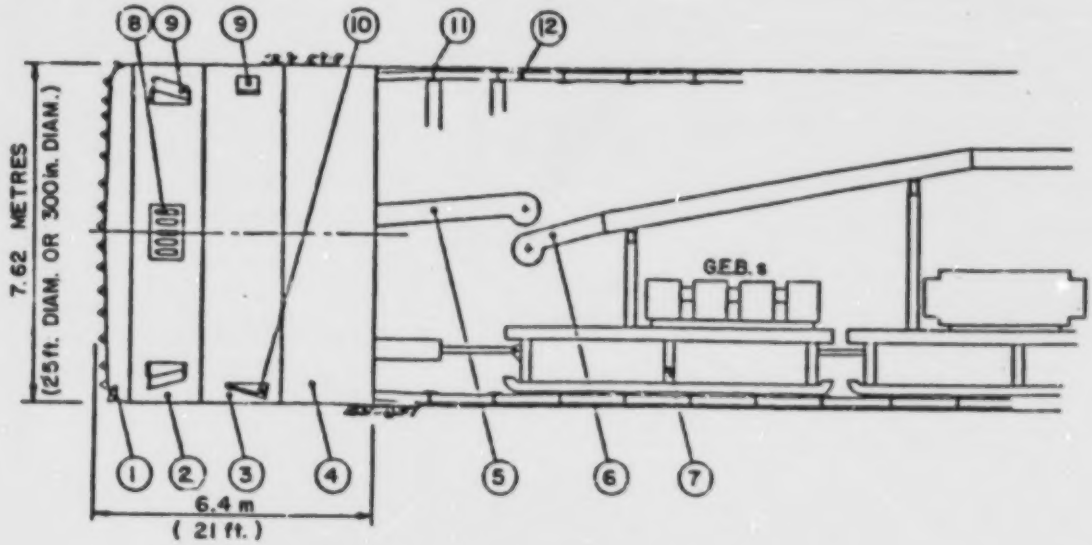
EXCAVATED PROFILE OF
TUNNEL NO. 3

June 1985

831-6014

BASIC TBM CONFIGURATION AND MACHINE PROPULSION METHOD

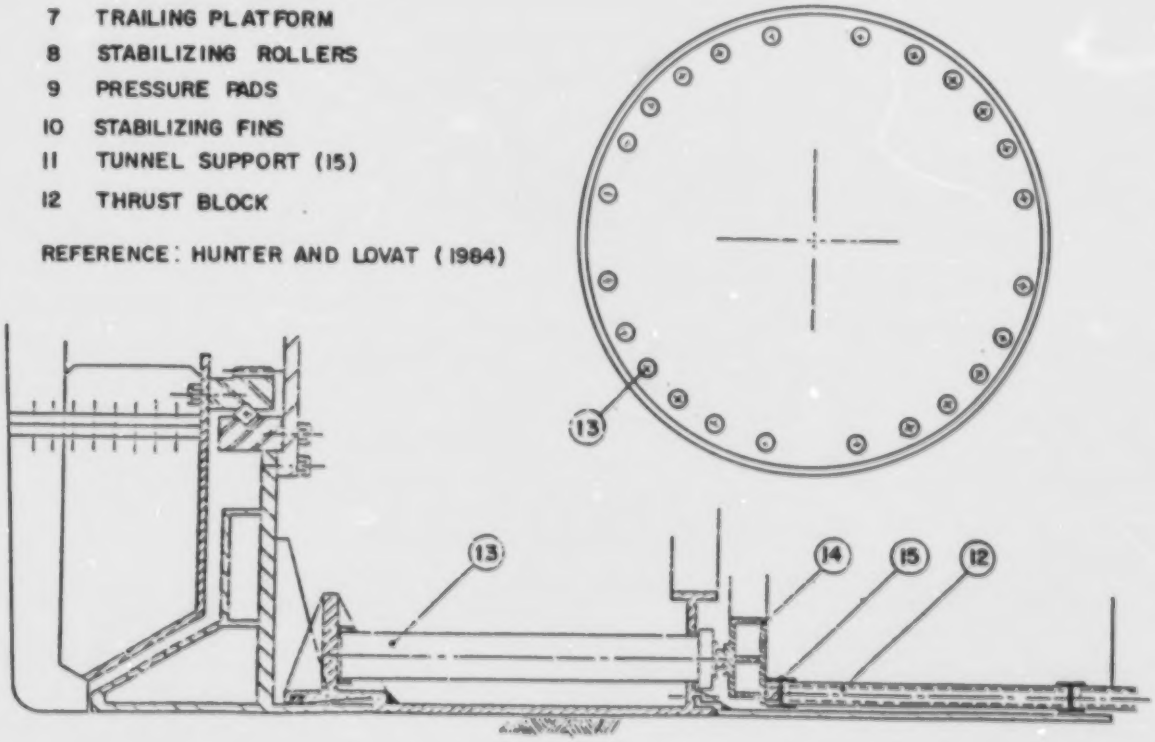
FIGURE I-5.4



BASIC TBM CONFIGURATION

1 CUTTING HEAD
2 FORWARD SHELL
3 STATIONARY SHELL
4 TRAILING SHIELD
5 PRIMARY CONVEYOR
6 SECONDARY CONVEYOR
7 TRAILING PLATFORM
8 STABILIZING ROLLERS
9 PRESSURE PADS
10 STABILIZING FINS
11 TUNNEL SUPPORT (15)
12 THRUST BLOCK
13 PROPULSION JACK
14 PROPULSION RING
15 STEEL SET

REFERENCE: HUNTER AND LOVAT (1984)



MACHINE PROPULSION METHOD

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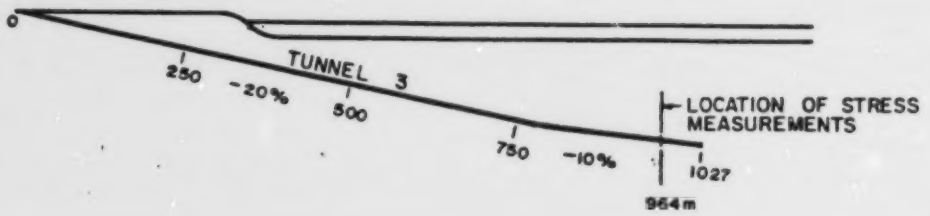
Chkd

FIGURE I-5.5

GENERAL DETAIL OF SUPPORT SYSTEM
FOR TUNNEL NO. 2

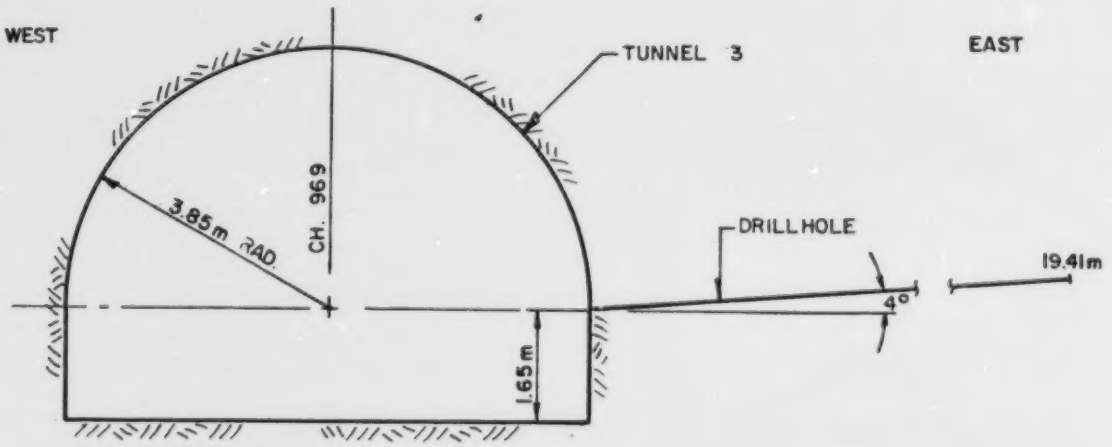
LAYOUT OF STRESS MEASUREMENT POSITIONS

FIGURE I-6.1



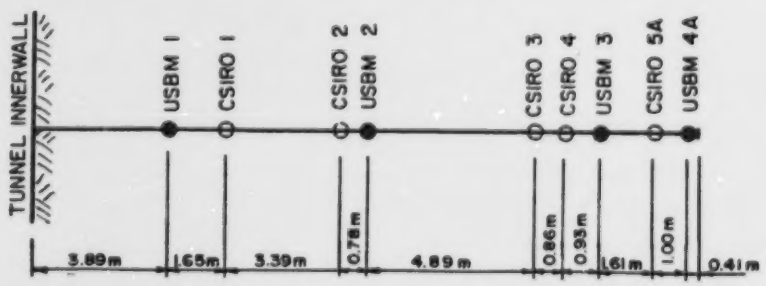
LONGITUDINAL SECTION OF TUNNEL 3 SHOWING LOCATION OF INSITU STRESS MEASUREMENTS

SCALE 1:1000



SECTION SHOWING POSITION OF STRESS MEASUREMENT HOLE

SCALE 1:10



POSITIONS OF STRESS MEASUREMENT TESTS

SCALE 1:20

Date NOV. 21, 1984

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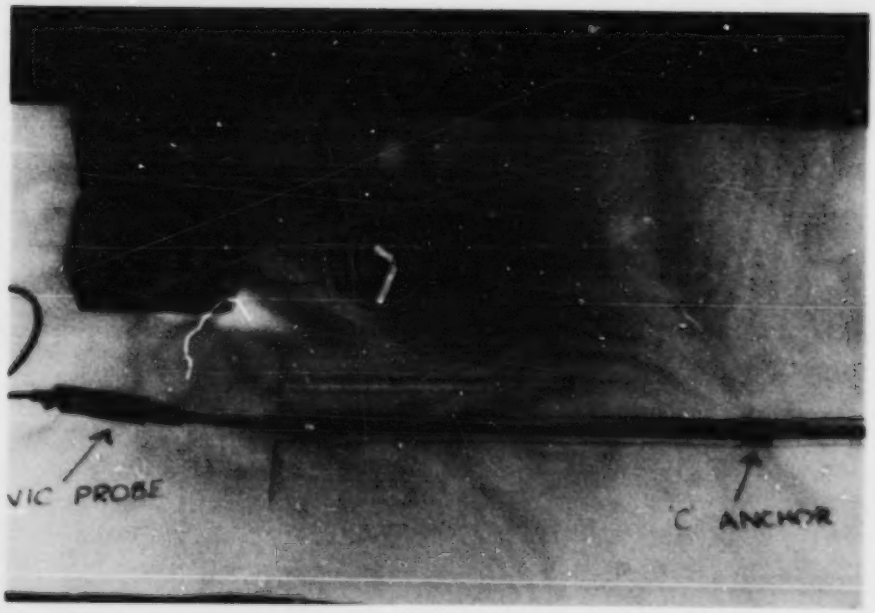
FIGURE I-6.2

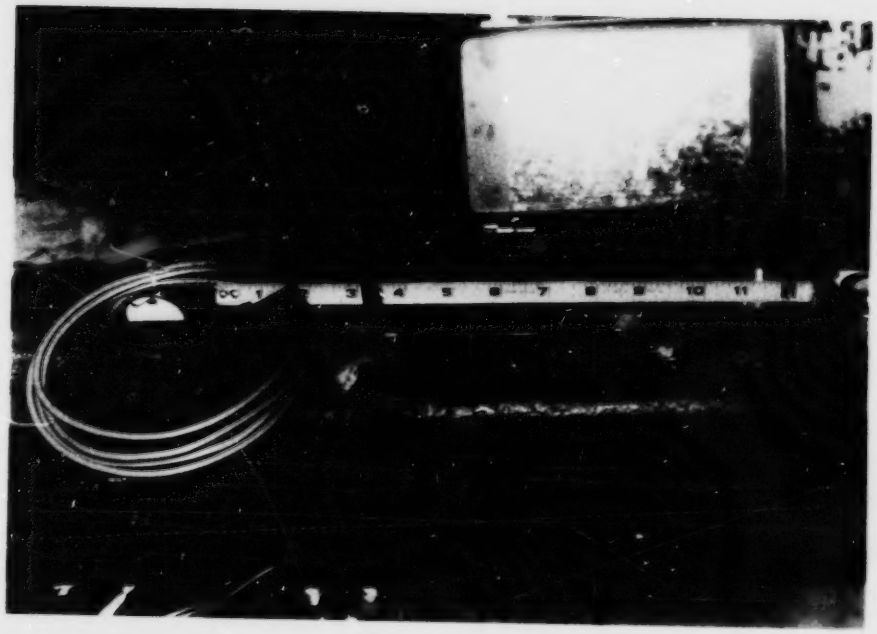
REFERENCE HEAD ASSEMBLY AND
RIGID SONIC PROBE

FIGURE I-6.3



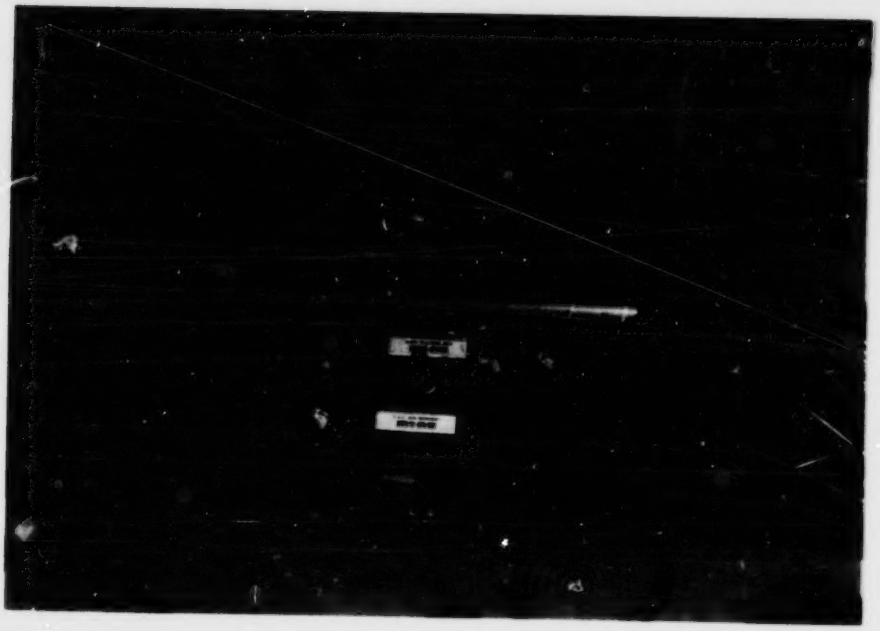
FLEXIBLE SONIC PROBE
EXTENSOMETER ASSEMBLY

FIGURE I-6.4



VIBRATING WIRE STRAIN GAUGE
INSTALLED ON THRUST BLOCK

FIGURE I-6.5



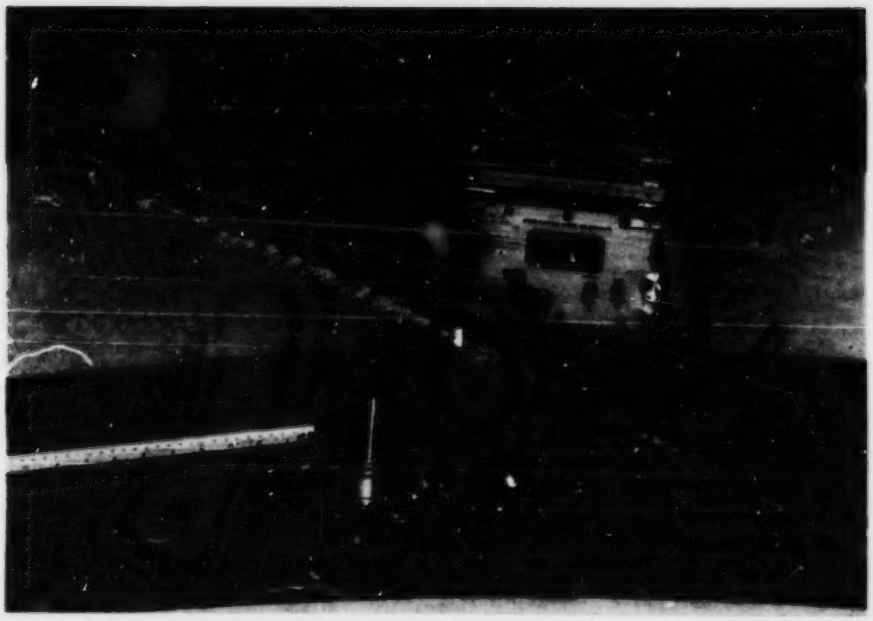
a) VIBRATING WIRE STRAIN GAUGES INSTALLED ON STEEL SET

b) VIBRATING WIRE STRAIN GAUGES BEING INSTALLED ON STEEL SET

VIBRATING WIRE STRAIN GAUGES INSTALLED ON STEEL SETS

FIGURE I-6.6

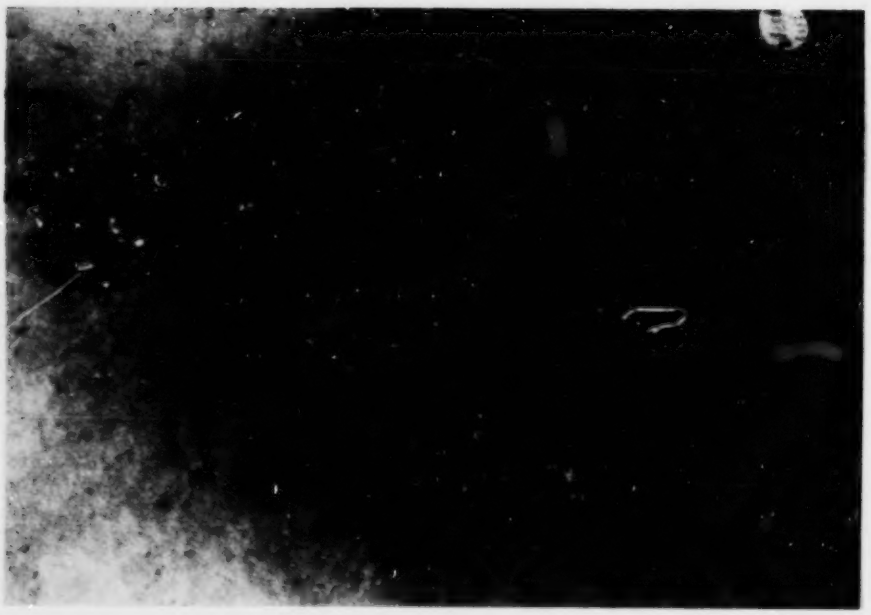
a) CIRCUMFERENTIAL PRESSURE CELL INSTALLED ON RING BEAM



b) TRANSDUCER ASSEMBLY INSTALLED FOR CIRCUMFERENTIAL PRESSURE CELL

CIRCUMFERENTIAL PRESSURE CELL AND TRANSDUCER ASSEMBLY

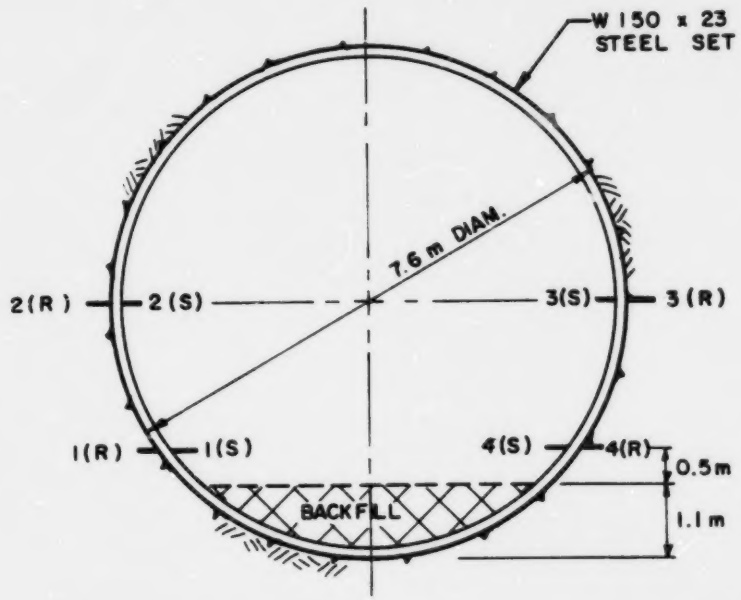
FIGURE I-6.7



AXIAL PRESSURE CELL WITH
TRANSDUCER IN PROTECTIVE COVER

LAYOUT OF CONVERGENCE POINTS IN TUNNELS No. 2 AND 3

FIGURE I-6.8



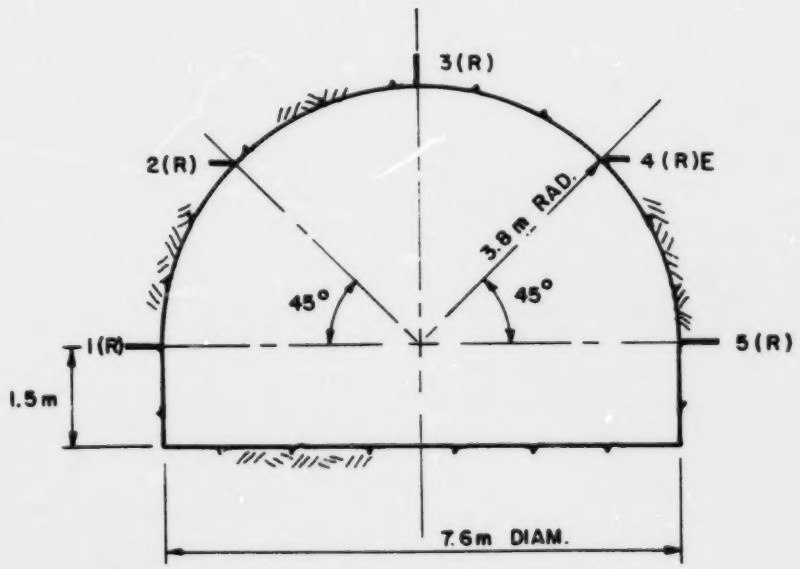
(a) TUNNEL No. 2

LEGEND

CONVERGENCE POINT

1(R) No. 1 IN ROCK

1(S) No. 1 ON STEEL SET



(b) TUNNEL No. 3

SCALE: 1: 1000

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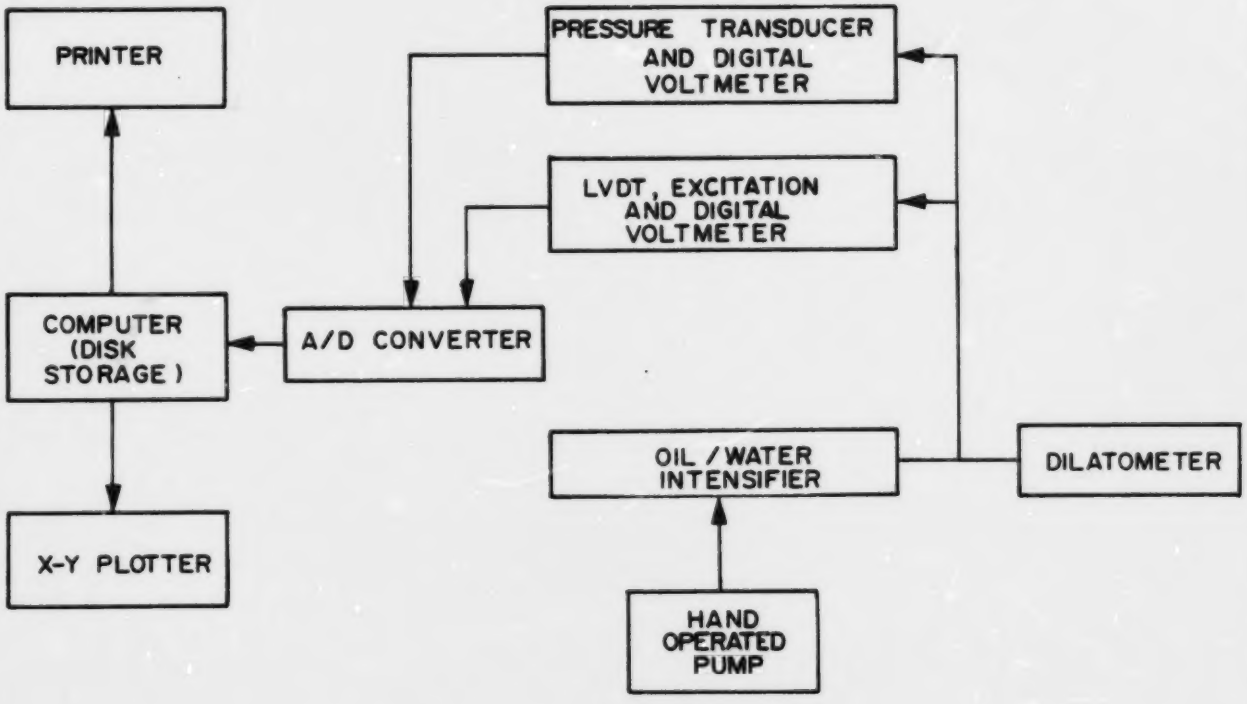
Form G.A.-D.-4 (M)

SCHEMATIC OF THE EQUIPMENT FOR INSITU MODULUS TESTING IN BOREHOLES

FIGURE I-6.9



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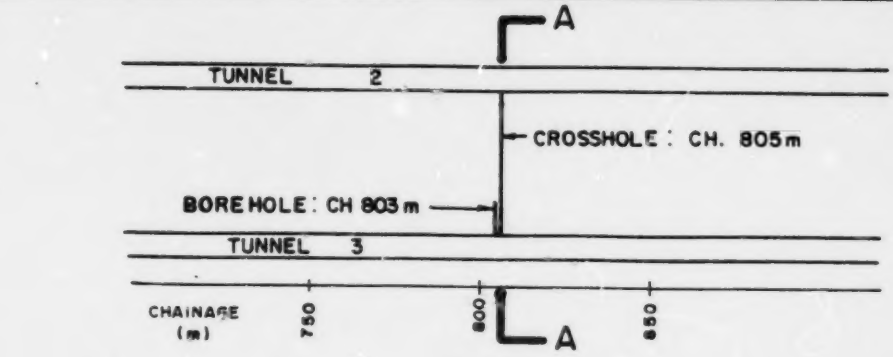
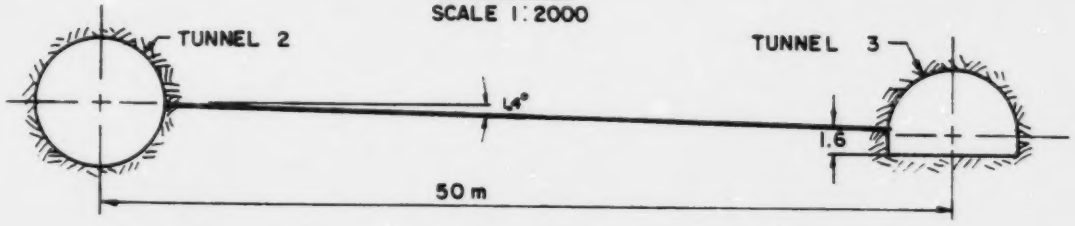
LAYOUT OF TEST POSITIONS FOR INSITU BOREHOLE MODULUS TESTING

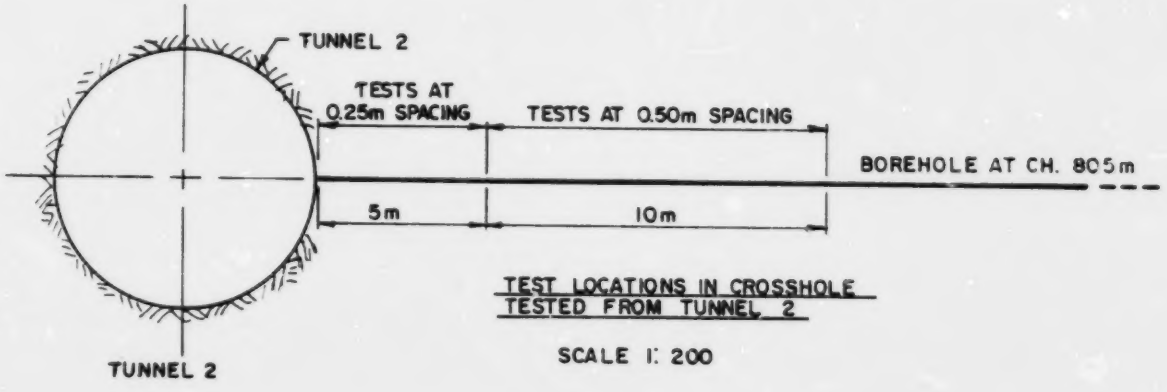
FIGURE I-6.10



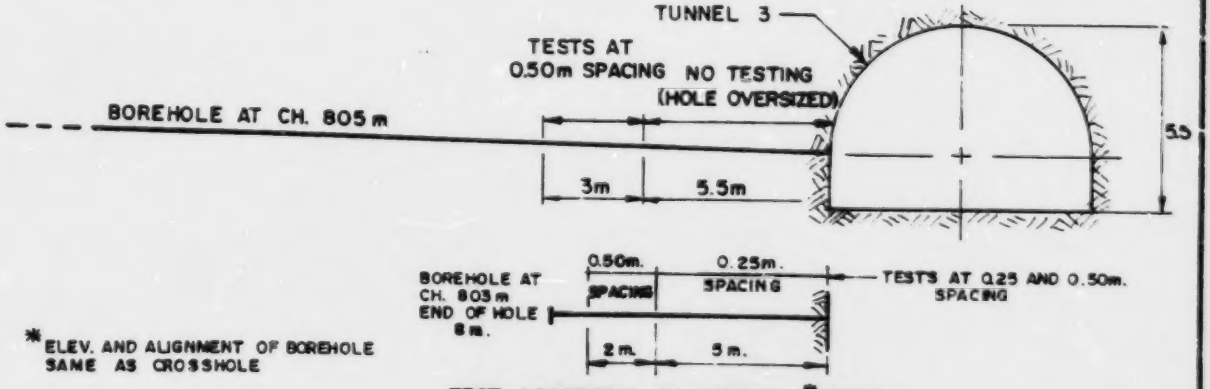
PLAN
SCALE 1:2000



SECTION A-A
SCALE 1:400



TEST LOCATIONS IN CROSSHOLE TESTED FROM TUNNEL 2
SCALE 1:200



*ELEV. AND ALIGNMENT OF BOREHOLE SAME AS CROSSHOLE

TEST LOCATIONS IN BOREHOLE* TESTED FROM TUNNEL No. 3
SCALE 1:200

Date NOV. 23, 1984
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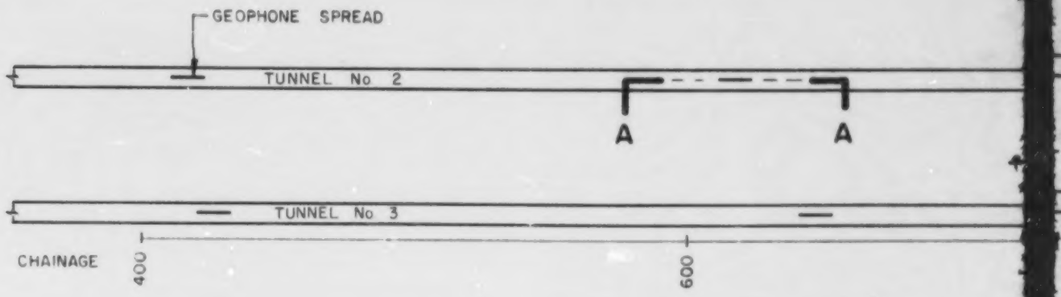
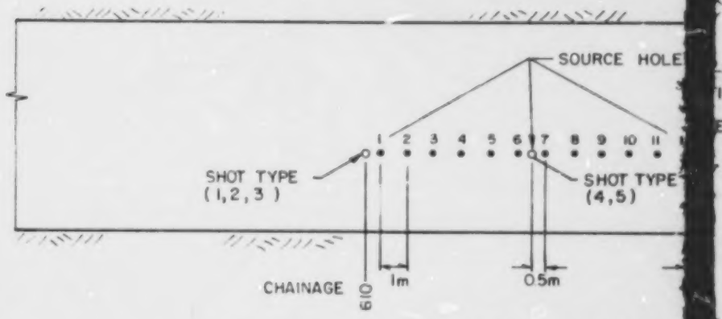


LOCATION PLAN OF GEOPHONE SPR

SCALE 1 2000

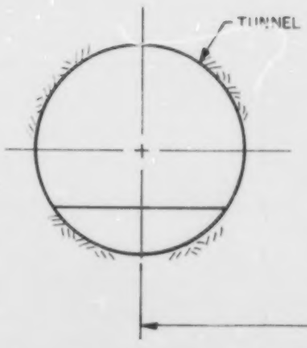
LEGEND

- GEOPHONE POSITIONS
- HAMMER SOURCE



SECTION A-A - TYPICAL LAYOUT OF GEO

SCALE 1 200

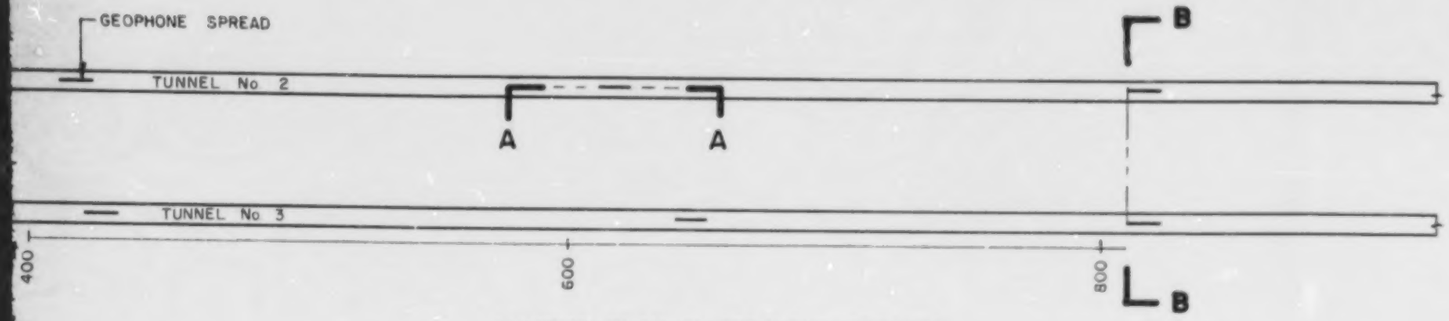


DETA

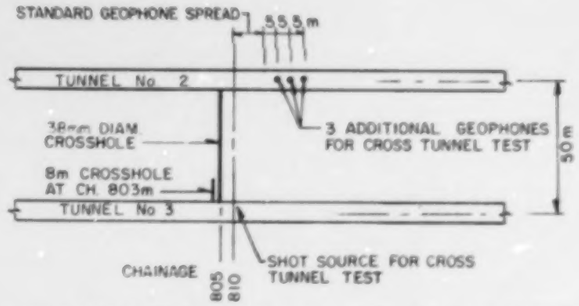
SECTION B-B - TYPICAL LAYOUT OF GEOPHONES

SCALE 1 200

LAYOUT OF GEOP
FOR HAMMER S
IN TUNNEL No



LOCATION PLAN OF GEOPHONE SPREADS
SCALE 1 2000



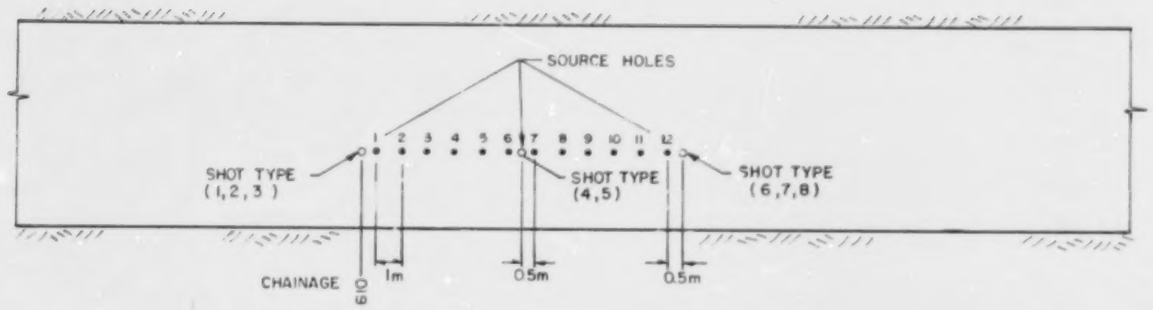
ADDITIONAL HOLES AT CHAINAGE 810 m IN TUNNEL 2
SCALE 1 2000

LEGEND

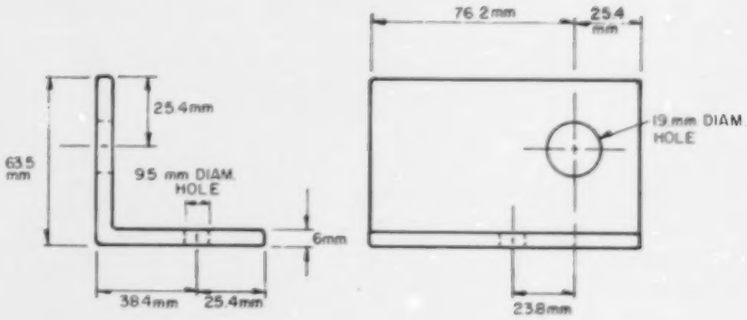
- GEOPHONE (No. 1)
- o SHOT SOURCE

SHOT TYPES

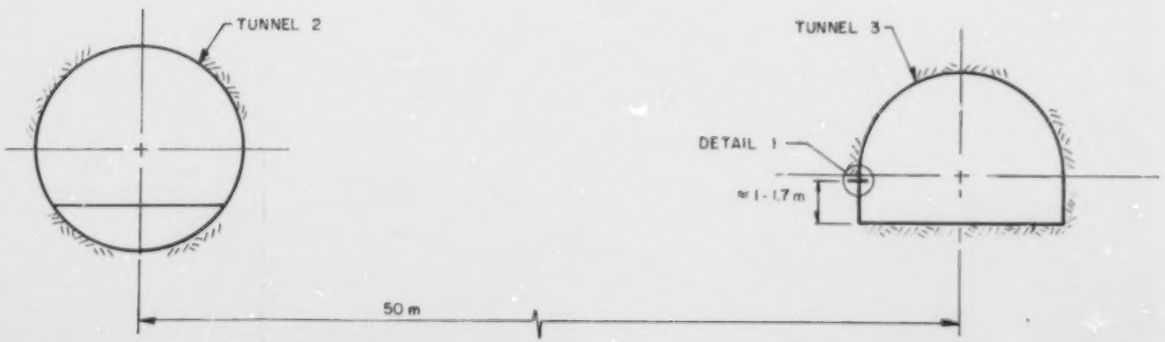
INWARD STRUCK SHOTS
UPWARD STRUCK SHOTS
DOWNWARD STRUCK SH



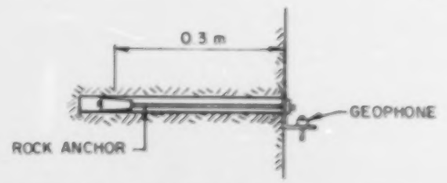
SECTION A-A - TYPICAL LAYOUT OF GEOPHONES ON TUNNEL WALL
SCALE 1 200



BRACKET FOR MOUNTING GEOPHONES
SCALE 1 2



SECTION B-B - TYPICAL LAYOUT OF GEOPHONES ON TUNNEL WALL
SCALE 1 200



DETAIL 1- GEOPHONE INSTALLATION
NOT TO SCALE

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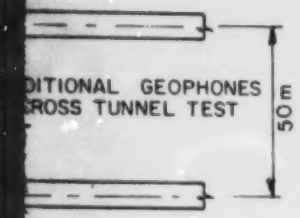
Gol

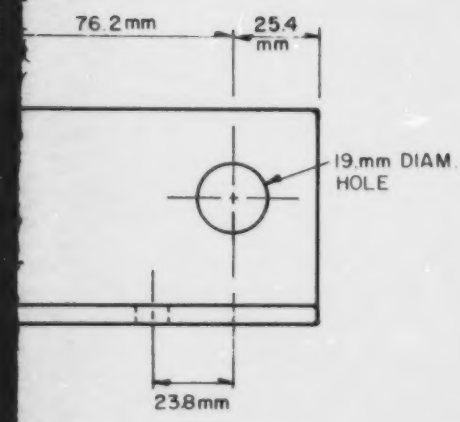
LAYOUT OF GEOPHONE SPREADS FOR HAMMER SEISMIC SURVEY IN TUNNEL Nos. 2 AND 3

FIGURE I-6.11

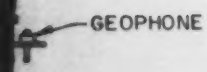


E FOR CROSS
ST

E 810 m IN TUNNEL 2



NG GEOPHONES



STALLATION

LEGEND

- GEOPHONE (No. 1)
- o SHOT SOURCE

SHOT TYPES

INWARD STRUCK SHOTS = (1, 4, 6)

UPWARD STRUCK SHOTS = (2, 5, 7)

DOWNWARD STRUCK SHOTS = (3, 8)

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Project 831-6014

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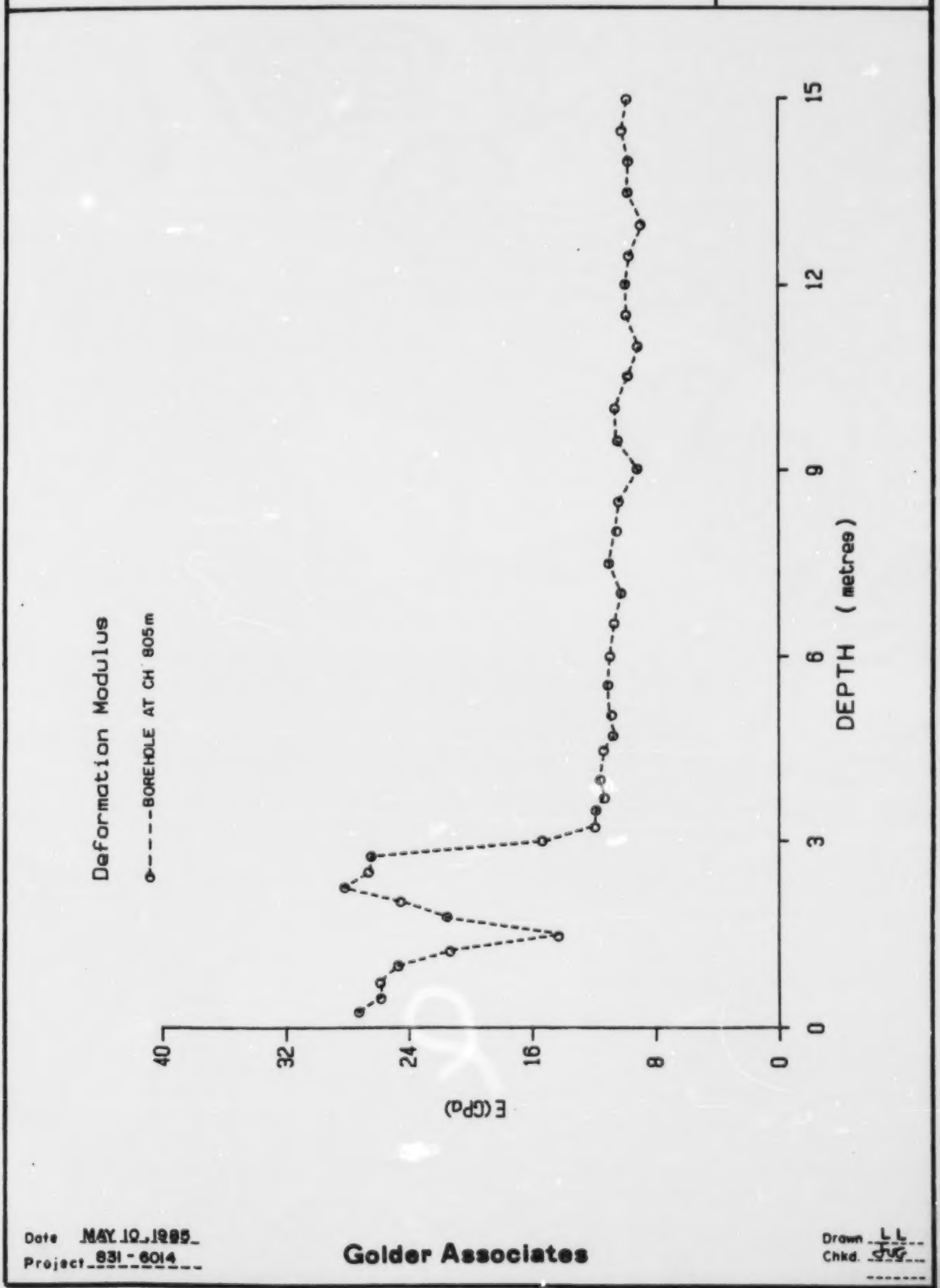
Drawn G.P
Chkd

DEFORMATION MODULUS WITH DEPTH FROM TUNNEL No. 2

FIGURE I-7.1



Date MAY 10, 1985
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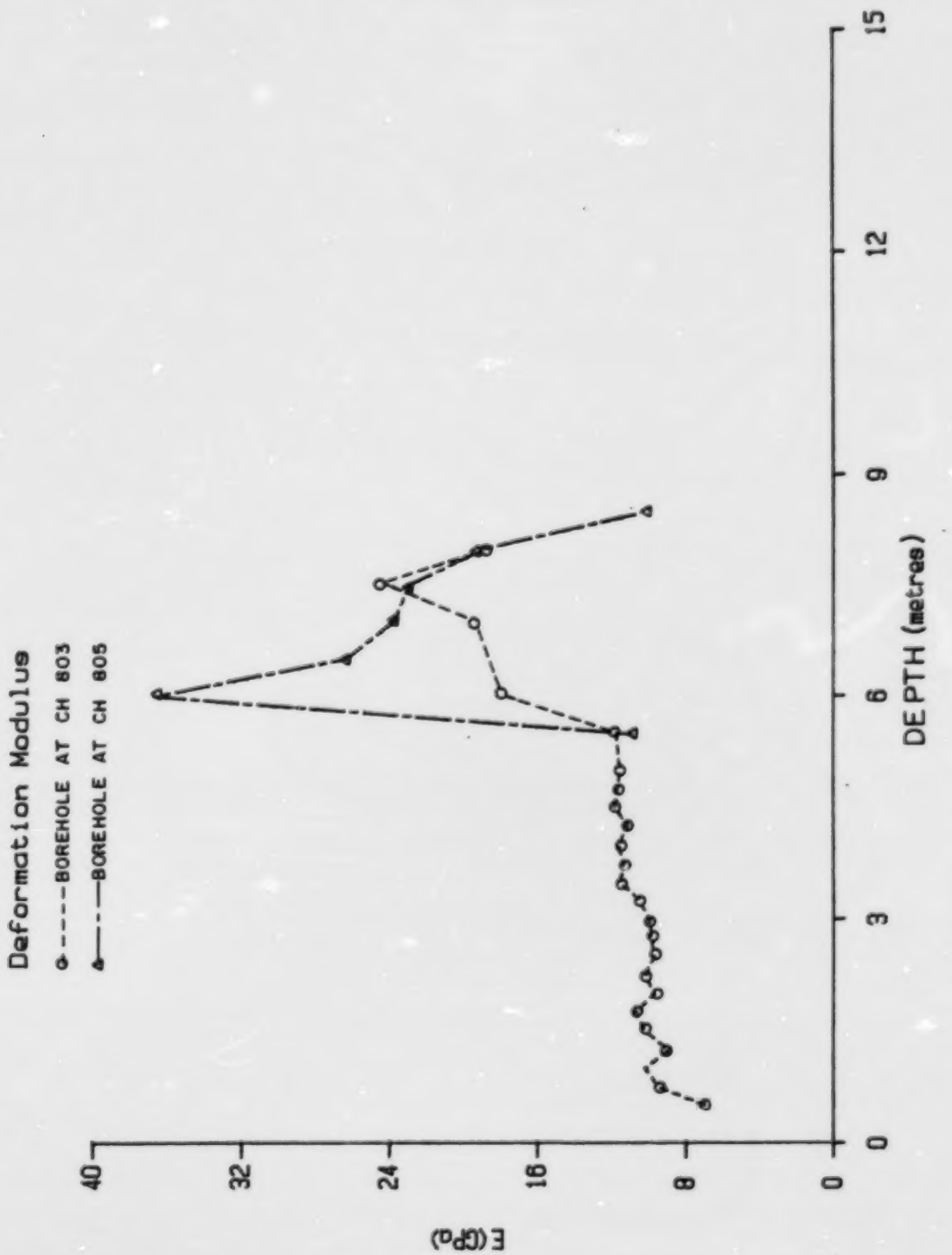
Drawn LL
Chkd. JVG

Form G.A.-D.-4 (M)

DEFORMATION MODULUS WITH DEPTH FROM TUNNEL No. 3

FIGURE I-7.2



Date MAY 10, 1985
Project 831-6014

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Drawn L.L.
Chkd. J.W.

Form G.A.-D.-4 (M)

Volume

2

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Canada Centre for Mineral and Energy Technology.

Énergie, Mines et Ressources Canada
Centre canadien de la technologie des minéraux et de l'énergie.

CANMET CONTRACT REPORT

No. 26SQ.23440-2-9159

MEASUREMENT AND ANALYSIS OF ROCK DEFORMATION AND SUPPORT SYSTEM RESPONSE IN THE DRILL AND BLAST AND BORED ACCESS DRIVAGES AT THE DONKIN-MORIEN PROJECT (UP-G198)

VOLUME II - ANALYSIS OF DATA

prepared by

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

Work on this project was conducted under the auspices of the Canada Centre for Mineral and Energy Technology, Energy, Mines and Resources Canada

JUNE 1985

Canada

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

REPORT TO
CANMET

MEASUREMENT AND ANALYSIS OF ROCK DEFORMATION AND SUPPORT SYSTEM RESPONSE IN THE DRILL AND BLAST AND BORED ACCESS DRIVAGE AT THE DONKIN-MORIEN PROJECT (UP-G198)

VOLUME II - ANALYSIS OF DATA

VOLUME I	- DATA REPORT
VOLUME II	- ANALYSIS OF DATA
VOLUME III	- APPENDICES A AND B
VOLUME IV	- APPENDICES C, D AND E

MAR 3 1988
MICROMEDIA

127 pp

June 1985

831-6014

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VOLUME II

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II-1 INTRODUCTION

The details of the instrumentation program and the results obtained have been described in Volume I of this report. This volume presents a limited and preliminary interpretation and analysis of parts of the field data.

The central purpose of the research program was to collect a set of comprehensive field data from the drill and blast and tunnel boring machine drivages such that the rock responses in the two types of excavation could be studied and compared. However, due to the limited length of tunnel drivage by the drill and blast method and the timing of the tunnel research program (drill-and-blast drivage in tunnel No. 3 was completed prior to commencement of the research program) very limited data was obtained from the drill and blast tunnel (Tunnel No. 3). Hence, the analyses presented in this report are more related to the rock response in the TBM excavation.

According to the requirements of the research contract, the emphasis was on data collection, the analyses to be undertaken at present were intended only to provide a basis for more detailed analyses which will be carried out in the future by other investigators. An outline of the scope of analyses that are included in this report is presented below:

(a) Comparison of deformation modulus determined by various field and laboratory methods.

(b) Preliminary interpretation and analysis of rock displacements measured within the tunnels.

(c) Preliminary interpretation and analysis of rock-support interaction.

(d) Preliminary interpretation and analysis of loading on thrust blocks.

In the presentation contained in this volume, references are made to the data and graphs presented in other volumes (Volume I, III and IV) of the report. Some of the graphs, and tables however, are repeated to clarify the presentation.

II-2 COMPARISON OF DEFORMATION MODULUS OF ROCK DETERMINED BY VARIOUS FIELD AND LABORATORY METHODS

II-2.1 Testing Program

In order to investigate the zones of excavation disturbance in the rock created by different methods of tunnel excavation in the Portal sandstone unit, both laboratory and field tests were undertaken to determine the deformation modulus of the rock close to the tunnel wall. The test program comprised the following items.

- Laboratory uniaxial compression tests on selected rock samples from cross boreholes drilled from tunnels No. 3 to 2 in the vicinity of ch. 800 m.
- In situ modulus testing in boreholes drilled from tunnels No. 3 to 2 at chainages 803 and 805 m.
- Seismic reflection surveys at approximately chainages 400 m, 600 m and 800 m in both tunnels No. 2 and 3.

The procedures used for each of the above tests and the results obtained have been presented in Volume I. A comparison of the results is presented in the following sections.

II-2.2 Comparison of Deformation Modulus Determined by Different Methods

For comparison purposes, the results obtained from the three different methods of modulus determination are presented in the summary Tables II-2.1 to II-2.3.

Table II-2.1 summarizes the modulus values obtained from the uniaxial compression tests on samples from boreholes at ch. 800 (N size extensometer hole) and ch. 804 drilled from tunnels No. 3 to 2. Table II-2.2 presents the in situ deformation modulus determined within 15 m of the walls of

tunnels No. 2 and 3. Table II-2.3 shows the deformation modulus calculated from the seismic wave (compression and shear wave) velocities in the rock mass measured within the tunnels.

Figures II-2.1 and II-2.2 present the summary plots of the variation in deformation modulus of the rock within 15 m of tunnels No. 2 and 3 respectively. Figure II-2.3 shows all the test data within the zone of rock between the two tunnels. In each of the first two Figures, the positions of the fractures/joints encountered in the cores obtained from the borehole at ch. 804 are indicated. The salient points obtained from these plots are discussed in the following sections.

Laboratory Deformation Modulus

The laboratory tests were conducted on cores recovered from the boreholes and are therefore representative of the properties of selected samples of intact rock. In situ modulus values in comparison are influenced by nearby fractures/joints in the rock mass.

Close to the walls of both tunnels, there are substantial variations in the laboratory modulus values. Within the first 4 m of tunnel No. 2, the laboratory deformation modulus varies from about 14 to 44 GPa. (see Figure II-2.1). Close to tunnel No. 3 the laboratory deformation modulus ranges from about 42 to 23 GPa (see Figure II-2.2). The modulus values are generally higher close to the tunnel wall and gradually reduce with increasing distance from the wall. Within the central 30 m of rock between the tunnels, the laboratory modulus values of the rock generally vary within a range of 20 to 26 GPa.

These variations in the laboratory modulus values are primarily attributed to the natural variations in the material tested. The grain size and the interlayered nature of the rock (see rock descriptions in borehole log for borehole at ch. 804 m) generally affect the deformation characteristics of the sample. The effect of grain size on deformation modulus was noted from the biaxial tests in overcored sandstone samples recovered from the east sidewall of tunnel No. 3 (see Appendix B). There is no apparent correlation between the laboratory modulus values and the excavation methods.

Insitu Deformation Modulus

The insitu deformation modulus tests were conducted to depths of 15 m and 5.5 m from the wall of tunnels No. 2 and 3 respectively.

In the vicinity of tunnel No. 2, the deformation modulus values within the first 3 m of the tunnel wall are generally higher than those further away from the tunnel. Considerable variations in modulus are also noted within this zone. Beyond the 3 m depth, the modulus values are almost uniform at about 10 GPa to a depth of 15 m (limit of testing).

Close to tunnel 3, a different trend is noted. The modulus values are generally uniform at approximately 10 to 11 GPa within 4 m of the tunnel wall. The modulus then increases, as evidenced by the results obtained in two separate boreholes which are only 2 m apart. The maximum modulus value is about 36.5 GPa. The value then drops off to about 10 GPa at approximately 8 m away from the wall.

Based on the discontinuity data collected from the borehole at chainage* 804, the positions of the fractures/joints encountered are summarized below:

Tunnel No.	Distance From Tunnel Wall	No. of Fractures**/Joints Encountered (position of fracture from tunnel wall)
2	0 - 1.5 m	1 (Joint at 1.5 m)
	1.5 - 15 m	0
3	0 - 0.3 m	3 (0.1, 0.15, 0.3 m)
	0.3 - 1 m	2 (0.36, 0.58 m)
	1 - 3 m	2 (1.13, 1.9 m)
	3 - 8 m	1 (7 m)

(** The number of fractures encountered within various zones of rock between the tunnels are also shown on Figures II-2.1 and II-2.2.).

In the immediate vicinity of tunnel No. 2, only one oblique joint (60° to core axis) was encountered at 1.5 m. The influence of this joint was reflected in a substantial drop in the deformation modulus values. The zone of influence appears to have extended to about 0.5 m on each side of the joint. Beyond this zone, no major discontinuity was identified from the core. The drop in the in situ modulus values appears to have been caused by the natural variations in the rock mass.

Immediately adjacent to tunnel No. 3, the fracture frequency is relatively higher. The laboratory deformation modulus is substantially higher than the in situ modulus values which appear to have been influenced by the fractures close to the excavation boundary. An examination of the cores indicated that the fractures within the first 2 m of tunnel No. 3 were typical of blast induced fractures as observed on the side-

* The fracture data from the E size boreholes drilled for the in situ modulus testing was highly influenced by the mechanical breaks due to the small core diameter. The borehole at ch. 804 was drilled with N size for fracture identification purposes.

walls of the tunnel. Beyond the first 2 m, only one fracture was encountered between 2 and 8 m (at 7 m). This fracture may have caused a decrease in the modulus values determined in BH 803 but does not have a similar influence on the results in BH 805.

It is apparent from the discontinuity data, and the laboratory and in situ deformation modulus values that the TBM excavation has caused minimal damage to the surrounding rock mass. On the other hand, the drill and blast excavation has induced fractures and caused a reduction in the deformation modulus in the rock in the immediate vicinity of the tunnel. The zone of excavation damage appears to extend to about 2 m from the tunnel wall.

Dynamic Deformation Modulus

The in situ dynamic deformation modulus of the rock was obtained from the seismic reflection survey as described in Volume I of the report.

Based on the spacing of the geophones and the intensity of the seismic source the deformation modulus of the rock obtained from the seismic surveys is considered to be representative of the average dynamic modulus of the zone of rock within about 2 m of the tunnel wall. The results presented in Table II-2.3 indicate that the modulus values increase marginally from ch 400 to 600 m but a significant increase is noted at ch 800 m. The modulus values close to tunnel No. 2 are consistently higher than those adjacent to tunnel No. 3 with the difference gradually reducing with increasing chainage. At chainage 800 m, the modulus close to tunnel No. 3 is only about 10% lower.

A review of the blasting records of tunnel No. 3 indicated that the quality of blasting improved steadily with the drivage of tunnel No. 3 (see Appendix A for blasting data from tunnel No. 3). This could have resulted in progressively less excavation damage on the tunnel wall.

The average dynamic modulus values adjacent to tunnels No. 2 and 3 are also plotted on Figures II-2.1 to II-2.3 with the range of distance represented by such values. It is of interest to note that the average dynamic modulus values are not significantly influenced by the fractures as long as they remain tight, which is the case observed in the vicinity of ch. 800 m. The magnitudes of average dynamic modulus generally lie between the laboratory and in situ modulus values.

The variation in primary wave velocity within the first 2 m of the wall rock in tunnel No. 2 was examined during the seismic survey and the results are presented in Section 7.8 in Volume I. It appears that there is a slight drop in the seismic velocity within the first metre of rock from the tunnel wall.

II-2.3 Summary

Of the three types of method of modulus determination, the in situ modulus testing provides the most realistic evaluation of the deformation characteristics of the rock mass. The laboratory values generally reflect the deformation properties of intact rock and therefore represent the upper bound of the modulus values. They are generally independent of the excavation methods because intact samples were preferentially selected for testing. Within the central 30 m of rock between the two tunnels where the modulus values determined by the in situ and laboratory method are relatively more uniform, the average ratio of (E lab/E in situ) is about 2.5. The seismic surveys provide modulus values intermediate between the laboratory and in situ values in the near surface rock. The results also provide a semi-quantitative assessment of the influence of excavation method on the surrounding rock.

Results of the in situ modulus testing and seismic survey on tunnel walls indicated that both the static and dynamic in situ deformation moduli of the rock are higher close to the wall of tunnel No. 2.

II-3 PRELIMINARY INTERPRETATION AND ANALYSIS OF TUNNEL DISPLACEMENT

As described in Volume I of the report, multiple point extensometers were installed to measure the rock displacements at various stations along tunnels No. 2 and 3. However, within the time frame during which the research program was undertaken, there was no advance in tunnel No. 3. All the displacement data obtained is therefore related to the displacements measured around tunnel No. 2 with the exception of some convergence data which was collected outside of this program.

In this research study, the following aspects of tunnel displacements were studied.

(a) monitoring of rock displacement around tunnel No. 2 during tunnel advance by pre-instrumentation; and

(b) monitoring of rock displacement and tunnel stabilization by installing extensometers at and behind the face, and by the use of limited convergence arrays.

The first aspect was undertaken in the portal sandstone unit within the first 1000 m of tunnel No. 2 where the adjacent tunnel No. 3 was used to facilitate pre-instrumentation. The second aspect was undertaken in the vicinity of the fully instrumented ring beams and at stations selected to cover a range of geological conditions.

The detailed procedures of extensometer installations and the results obtained at each extensometer array or position have been presented in Volume I. This section examines the results obtained and their implications on subsequent rock-support interaction analyses (Vol. II Section 4).

II-3.1 Tunnel Displacement in the Sandstone Unit During Tunnel Advance

II-3.1.1 General

The research program provided an opportunity to study the effect of tunnel advance on rock displacements by the use of pre-installed extensometers ahead of the advancing tunnel face. Multiple point extensometers were installed at two stations within the relatively massive "Portal" sandstone unit as described in Volume I. Some problems were encountered in the extensometers at chainage 900 m where the extensometer rods showed stepped movements (see Volume I).

Analysis of the tunnel displacement during TBM advance was based on the results obtained at ch. 800 m because this is the station where the in situ modulus testing was undertaken. The following sections present a comparison of the theoretical and measured displacements.

II-3.1.2 Theoretical Considerations

The theoretical displacements around the advancing face of a tunnel have been considered by the use of analytical solutions (e.g. Niwa et al, 1979 Descorudres, 1974) as well as by numerical methods (e.g. Panet & Guenot, 1982; Ghaboussi and Gioda, 1976). By the use of the integral equation method, Niwa et al. (1979) have developed an analytical solution for evaluating the stresses and displacements around an advancing tunnel for the cases of a unidirectional stress parallel and perpendicular to the tunnel axis and of a uniform shear stress field parallel to the tunnel axis. By super-position of these results, the stresses and displacements can be evaluated for any state of initial stress.

In this study, Niwa's (1979) solution was used to examine the theoretical displacement in the rock during the TBM advance. The parameters used for the evaluation are discussed below.

In situ Stress Condition

Based on the results of the in situ stress measurements undertaken at ch. 964 m in tunnel No. 3, the in situ horizontal (P_h) to vertical stress (P_v) ratio (k_o) is about 2.5. The vertical stress at the location of the extensometer is about 4.9 MPa. The in situ stress system is assumed to be acting in the plane of the extensometer.

Mechanical Properties of Rock

The rock type in which the extensometers were installed is a relatively massive sandstone unit with occasional carbonaceous layers. A rational evaluation of the rock displacements requires the use of the in situ deformation modulus for the analysis. However, as discussed in section 2, there are substantial variations in the in situ modulus values in the zone of rock immediately adjacent to tunnel No. 2. In order to utilize the solution for a homogeneous medium, the average deformation modulus in the vicinity of the anchor position under consideration was used. A Poisson's ratio of 0.25 for the rock was used.

Theoretical Displacement During Tunnel Advance

Using the solution by Niwa et al (1979), the theoretical displacement curve at the springline of the tunnel during tunnel advance was evaluated for a biaxial in situ stress system of P_v = 4.9 MPa, P_h = 12.5 MPa (k_o =2.5). An average rock modulus of 22.4 GPa (average modulus value for the first 3 m zone of rock adjacent to tunnel No. 2) was used.

Figure II-3.1 presents a plot of the theoretical horizontal displacement at the springline with distance of the face from the instrumented section. The results indicate that theoretically rock displacement has already commenced when the face has approached within 8 m (one tunnel diameter) of the instrumented section. As the face approached, the displacement increases and becomes stabilized when the face is about 15 m (two tunnel diameters) past the instrumented section. It is also noted that about one-third of the total elastic displacement had occurred when the face reaches the instrumented section and about 97% of the total displacement has taken place when the face is about one tunnel diameter past the instrument.

Distribution of Displacement within Rock Mass

The theoretical distribution of displacement within the zone of rock between the two tunnels was evaluated using finite element analysis. The variation in the deformation modulus in the rock (as measured by in situ modulus testing) was taken into account by assigning the average of the measured modulus values for the appropriate zones of rock as follows:

Zone	Average Deformation Modulus
0 - 3 m from wall of tunnel No. 2	22.4 GPa
3 m - 42 m from wall of tunnel No. 2	10.6 GPa

The in situ stress conditions for the analysis are based on P_v = 4.9 MPa and k_o = 2.5 as discussed earlier.

Figure II-3.2 shows the distribution of theoretical and measured elastic displacement at the springline with distance from the wall of tunnel No. 2. The theoretical displacements are plotted relative to the theoretical displacement at a depth

of 42 m to allow direct comparison with measured data (displacements measured by extensometer were referenced to the head assembly at 42 m from the wall of tunnel No. 2).

The displacement in the rock decreases with increasing distance from the tunnel wall. Due to the increase in deformation modulus in the immediate vicinity of the tunnel (tunnel No. 2), the displacement in this zone is less than that in an otherwise homogeneous medium with a deformation modulus value of 10.6 GPa.

II-3.1.3 Comparison of Measured and Computed Displacements

Displacement During Tunnel Advance

The measured displacements at the extensometer anchor positions at ch. 800 m are shown on Figure C.1 in Appendix C. This figure shows the changes in displacement with time during drivage of tunnel No. 2. The results indicate that movements of the rock started to take place ahead of the face and the response of the extensometer corresponded very well with the TBM activity. For example, the rock movement stopped when drivage was temporarily stopped for support installations and other ancillary activities, and continued when drivage (face advance) resumed. The displacement data from this extensometer is presented in Figure II-3.3 with the measured displacement (referenced to the head assembly at 42 m) plotted against the face distance from the instrumented station (ch. 800 m). It is noted that the displacement of the 1.5 m anchor was less than that at the 3 m anchor, a trend which is not consistent with normally anticipated distribution of displacement with depth. However this trend was slowly reversed as illustrated by the final readings recorded in 1985 when the face was 2600 m past.

To compare the measured and theoretical displacement during tunnel advance, both the theoretical and measured displace-

ments at the 1.5 m anchor position are plotted against face positions on Figure II-3.4. The theoretical curve represents only the elastic displacements and is derived on the following basis:

- the analytical solution of displacement given by Niwa et al (1979)
- the in situ stress conditions are P_v = 4.9 MPa, k_o = 2.5, E = 22.4 GPa
- the theoretical displacements shown are displacements relative to that at 42 m from the wall of tunnel No.2 such that there is a common basis for comparing the magnitudes of displacement
- the theoretical displacements at 1.5 m depth are based on the theoretical distribution shown on Figure II-3.2.

Based on the measured data, the displacement in the rock started to occur slightly sooner than theoretically anticipated but the magnitude of displacement during this initial stage of response was small and within the measurement accuracy of the extensometer.

When the face was about 15 m (two times the tunnel diameter) from the instrument, the rock displacement gradually started to increase but the rate of increase was slow until the face passed the instrumented section., At this stage, the displacement increased at a faster rate but was still substantially lower than the theoretical rate. The displacement continued to increase very slowly when the face was about 80 m away, approximately 7 days after the face has passed the instrumented section. The final reading taken in March 1985 indicated that the anchor at 3 m moved about 1.3 mm over the one year period. Similar trends of displacement with face

distance were noted in all the other anchors of this extensometer. The apparent larger long term movement at the 1.5 m anchor position arose from the fact that the initial movement at this anchor was low.

While the trend of theoretical and measured displacements are similar it is apparent that the actual rock mass response in the three-dimensional displacement field is somewhat different from that which was anticipated based on theory.

If elastic rock displacements are considered to have been completed when the face advanced one to two times the diameter of the tunnel past the instrumented section, the results of the displacement measurements are indicative of some time-dependent movement in the rock.

Distribution of Displacement with Depth

To compare the calculated and measured elastic displacement in the rock mass, it was assumed that all the elastic displacements had occurred when the face advanced for a distance equal to one to two times the tunnel diameter from the instrumented section. Subsequent displacements are attributed to time-dependent movement due to "delayed" elasticity.

Based on the results of the displacement measurement, the total and elastic components of the displacements at various anchor positions at ch. 800 m are summarized below:

Anchor Distance From Wall of Tunnel No. 2	Component of Elastic Displacement Inferred from Measured Data (mm)	Total(3) Displacement (mm)
1.5	1.68(1) - 2.51(2)	6.32
3	2.39 - 3.25	5.84
6	1.88 - 2.62	4.01
21	0.33 - 0.48	1.07
42 (ref)		

Notes:

(1) Displacement which has taken place when the face had advanced 7.6 m (1 x tunnel diameter) past ch. 800 m

(2) Displacement which has taken place when the face had advanced 15.2m (2 x tunnel diameter) past ch. 800 m

(3) Displacement measured when face was at ch. 3579 m.

(4) All displacements were measured relative to the anchor at 42 m from the wall of tunnel No. 2.

The above data is plotted on Figure II 3.2 where the theoretical distribution of displacement is presented. It may be noted that the computed elastic displacements agree reasonably well with the range of elastic displacements inferrred from the data at the 3, 6 and 21 m anchor positions. At the 1.5 m anchor position, the inferred elastic displacement is substantially lower than the computed values. The recorded data however indicates that relatively larger displacement occurred at the 1.5 m anchor in the long term (see Figure C.1 in Appendix C).

II-3.2 Tunnel Displacements in Tunnel No. 2

Displacements around tunnel No. 2 were measured within the tunnel using multiple point extensometers installed at or behind the face depending on the availability of access for such installations to take place during the TBM excavation cycle. Table II-3.1 summarizes the locations of the extensometers and the rock types in which the anchors were positioned.

As described in Volume I rigid sonic probe extensometers were used for the initial installations. Upon review of the results of the measurements, it was established that the zone of active movement was located within the first 3 m of the tunnel and it would be desirable to examine the displacements in this zone in greater detail. Flexible sonic probe extensometers were subsequently used to provide more measurement points in the zone of active movement.

In all extensometer installations, the measured displacements are relative to the surface anchor located at the collar of the hole. The principal interests in the displacement monitoring program within Tunnel No. 2 are:

(a) to study the response of the rock strata to the excavation of the tunnel, and

(b) to provide a means of determining the zone of active movement adjacent to the excavation boundary and the stability condition of the tunnel.

Due to the difference in the tunnel grade and the general dip of the rock strata through which the tunnel was driven, different rock types were encountered along the length of the tunnel. Accordingly, the displacement data recorded at the extensometer was affected by the relative competence of the strata encountered (especially at the crown of the tunnel), the deformation characteristics of the strata due to stress

redistribution around the excavated tunnel and the installed rock support system.

All the extensometer data is presented on Figure C.1 to C.22 in Appendix C. The displacement data is discussed in the following section.

II-3.2.1 Discussion of Displacement Results

General

Table II-3.1 presents an overall summary of the extensometer data which includes the positions of the extensometers, the distance of the extensometers from the face when they were installed, the maximum surficial displacement measured, the estimated depth of the zone of active movement (probably loosening), the rock types encountered at each of the extensometer positions and comments on the results.

As shown in Table II-3.1, the extensometers were installed primarily at three orientations, vertically upward, upwardly inclined at about 15 degrees to the horizontal, and vertically downward. The uphole extensometers were used to detect the zone of loosening at the crown from which the rock load on the support system can be evaluated. The side extensometers were intended to provide a measurement of the haunch stability and detect potential bedding plane slip. Finally, the downhole extensometers were utilized to detect floor heave at the invert location. As far as stability monitoring is concerned, the uphole extensometers are most critical. Hence, most of the extensometers were installed in the crown of the tunnel. The salient points observed from the displacement data are discussed below.

Pattern and Magnitude of Displacement

For all the extensometers installed in tunnel No. 2, the displacements measured at the anchor positions indicated inward movements with the exception of the values at ch. 925 which were affected by mechanical breakage of the rock at the hole collar to expose the extensometer head (see section I-6.2.1). At the invert of the tunnel, heaving was observed, whereas at the crown, downward movement of the strata was measured. At the haunches where inclined extensometers were installed, the results were limited but they are indicative of smaller movements.

In general, the movements were large at the excavation surface and progressively decreased with depth until at some point from the surface there was essentially no movement. This was generally reflected in the negligible relative displacement between the deeper anchors. Further discussion on this and its implications are presented in Section II-4 of this volume.

As shown in Table II-3.1, some of the extensometers were installed at the face while others were installed at some distance behind the TBM due to lack of access. The timing of extensometer installation had a significant bearing on the data recorded since the displacement measured was a function not only of the type of rock encountered but also of the face position when the measurements were undertaken. Hence, the displacement data as recorded can be separated in two groups as follows:

GROUP A Extensometers Installed at Face	GROUP B Extensometers Installed Behind TBM Shield (Distance from face)
2T925EA	2T920ED (7 m)
2T925EB	2T1420ED (7 m)
2T925EC	2T1881ED (7 m)
2T1428EA	2T2433EA (41 m)
2T1428EC	2T2749EA (10 m)
2T1889EA	2T3385EA (8 m)
2T1889EB	2T3522 (62 m)
2T1689EC	2T3573 (5 m)
2T2263EA	
2T2996EA	
2T3205EA	
2T3457EA	

The extensometers under Group B recorded primarily the time-dependent components of the displacements. For the Group A extensometers, most of the total elastic displacement would be measured. However, it was difficult to separate this component from the recorded results especially for the cases of the extensometers installed at the crown of the tunnel. This is due to the fact that during the TBM drivage, the first 8 m of the tunnel was unsupported because of the fully shielded design of the LOVAT TBM. During this stage loosening of the strata resulting from overstressing and subsequent breakage gave rise to considerably larger displacement than the magnitude of elastic displacement in an otherwise competent rock with no local failure. Based on the results of finite element analysis (see Section II-3.3) the magnitude of elastic displacement at the crown of the tunnels at the extensometer stations varies between 2 to 3 mm (downward).

In the sandstone strata within the first 1200 m of tunnel drivage very minor spalling at the back was observed. When the tunnel was driven through the mixed sediments, because of the presence of less competent strata and the feather edge features (the rock strata are dipping about 7 degrees with respect to the tunnel alignment) of the various rock strata, more spalling at the back was observed as the rock was exposed

behind the TBM shield. These observations are consistent with the relatively large displacement measured prior to the installation of the ring beam support (indicated as ring expanded) as shown on the plots corresponding to the Group A extensometers that are located in the weaker strata.

Within the Group A extensometers, the installation at ch. 925 (including extensometers 2T925EA, 2T925EB and 2T925EC) were not particularly successful due to problems with drillhole sizes and installation as described in Volume I. The results are therefore not reliable. Similarly, the extensometer at the west haunch of ch. 1428 m (2T1428EB) was completely blocked by the ring beam as it reappeared behind the TBM.

Based on the results of the extensometer measurements (see Appendix C-1), the pattern of rock displacement in tunnel No. 2 can be summarized as follows:

The rate of rock displacement was usually high prior to the installation of the supporting ring beam due to rock loosening. This rate continued for a short period after support installation because it took some time for the support to fully interact with the rock. Thereafter the rate of displacement gradually reduced and the readings became stabilized within 5 to 20 days depending on the geological conditions, the advance rate of the tunnel and the position of the face when the extensometer was installed. Stabilization of the displacement reading is indicative of the equilibrium condition.

The distribution of displacement with depth was monitored by means of extensometer anchors installed at different depths along the extensometer hole. Due to the relatively wide spacing of the anchors in the rigid sonic probe extensometers, the zone of active movement could not be precisely determined. With the use of flexible sonic probe extensometers, more anchors were installed within the first 3 m of

the rock surface. This procedure provided considerably more data on the distribution of displacement in the near-surface zone. Of significance is the zone of active displacement at the crown of the tunnel because the load from this loosened zone would eventually be supported by the ring beam installed behind the shield.

In order to examine the displacements within this zone more closely, the stabilized displacements of the anchors were plotted for each of the extensometers installed at the crown of the tunnel as shown on Figures II-3.5 to II-3.10. In all the plots, the deepest anchor of the extensometer was assumed to be stabilized and hence not subject to any displacement. It should be noted that the main intent of these plots is to examine the relative extent of the zone of active displacement. Direct comparison of the magnitude of displacement at different extensometer stations can only be made under the same installation conditions with due regard to geological conditions.

Based on the displacement plots, it is possible to identify the zone of active displacement and to examine the displacement characteristics at strata contacts, in particular the coal seams. The following characteristics are noted:

- In the Group A extensometers, the measured displacements were generally less when types II or III rock are located at the crown than the case where types V or VI rock are present.

- Approximately 90 per cent of the total displacement occurred within the first 0.9 m to 1.7 m of rock at the tunnel crown depending on the stratigraphy encountered

- In general there was practically no rock movement deeper than 3 m above the tunnel crown. There was negligible relative displacement between the anchors located beyond. 3 m

- Where the coal seam was located about 1 m above the crown, displacement within the coal seam was detected (e.g. at ch. 1428 m). Where the coal seam was located about 2 m above, very slight movement occurred across the contact of the coal seam and the underlying rock layer, but there was no evidence of strata separation at the top of the seam (ch. 2263 and ch. 3457).

II-3.3 Examination of Failure Zones in Tunnel No. 2

II-3.3.1 Stress Analyses of Tunnel Excavation

As discussed in the previous section, the displacement at the crown of the tunnel arose primarily from rock loosening which was initiated by localized overstressing of the rock. In order to examine the extent of the failure zone based on the stress conditions, a series of elastic finite element analyses were undertaken for tunnel No. 2 at the following chainages.

Ch. 925	Array T2-1
Ch. 1420	Array T2-2
Ch. 1831	Array T2-3
Ch. 1889	Extensometer at crown of tunnel
Ch. 2263	Extensometer at crown of tunnel
Ch. 2433	Extensometer at crown of tunnel
Ch. 2996	Extensometer at crown of tunnel
Ch. 3209	Extensometer at crown of tunnel
Ch. 3353	Array T2-4
Ch. 3457	Extensometer at crown of tunnel
Ch. 3522	Extensometer at crown of tunnel

The finite element program incorporated up to five layers of different rock types with automatic mesh and input data

generation. Constant strain, triangular elements were used. The typical finite element grids for the stratigraphic profile at Ch. 3522 m is shown on Figure II-3.11.

Input Parameters

The input parameters required for the finite element analyses include the insitu stress conditions, the elastic properties and the strength characteristics of the rock mass for evaluating rock failure conditions. The rock mass failure criteria used in the analyses were based on the following expression suggested by Hoek and Brown (1980):

$$\sigma_1/\sigma_c = \sigma_3/\sigma_c + [\, m\sigma_3/\sigma_c + s]^{1/2}$$

where σ_1, σ_3 = major and minor principal stresses applied to the rock

σ_c = uniaxial compressive strength of the intact rock pieces in the rock mass

m, s = material constants which relate to the jointed nature of the rock mass

The following input stress conditions were used:

P_v = 5 MPa, P_h = 12.5 MPa, Ko = P_h/P_v = 2.5

The elastic properties and the strength of the rock mass for different rock types were based on the laboratory test results and the observed insitu condition of the rock types as they were exposed in the tunnel. These rock parameters are summarized below:

ROCK TYPE		ROCK MASS PARAMETER				
		E (MPa)		σ_c (MPa)	m	s
I	Sandstone	24000	0.25	92	5	0.1
II	Interbedded Sandstone - Siltstone	17600	0.25	121	5	0.1
III	Siltstone	11000	0.25	53	5	0.1
IV	Interbedded Siltstone - Mudstone	9000	0.25	36	5	0.1
V	Mudstone	5400	0.25	36	5	0.1
VI	Carbonaceous Mudstone	3450	0.1	16.6	0.05	0.00001
VIA	Coal Seam	3450	0.1	16.6	0.05	0.00001

E = deformation modulus ν = Poisson's ratio

σ_c = Uniaxial compressive strength of intact rock specimen

m, s = parameters defined earlier; for intact rock s = 1.0

Where two rock types were identified (as interbedded materials e.g. II-III) in one layer, the rock type with the lower strength (Type III) was assumed to control the failure in that particular layer.

Results of Analysis

Based on the failure criteria described above, zones of overstress as a result of compressive shear failure or tensile fracture were identified and the results are summarized below:

(a) With the exception of ch. 925 m where the tunnel is located entirely in the competent "Portal" sandstone unit, localized overstressing occurred at all the stations. The zones of compressive shear failure were located at the crown and the invert of the tunnel where the rock mass was subjected to maximum stress concentration in the horizontal direction. Furthermore, at these positions, the confining stresses in the rock were reduced due to the excavation of the tunnel. This combination of stress changes would have caused localized overstressing of the weaker strata in the immediate vicinity of the tunnel excavation. The overstressed zone was generally limited to about 0.5 to 1 m from the crown or the invert and extended to about 2 m laterally.

Zones of limited tensile overstress generally occurred in areas located about 45° above and below the spring-line of the tunnel.

(b) Where the coal seams were located close to the tunnel, extensive shear failure occurred in the seam. It is noted, however, that the failure was only confined to the seam itself if there was a relatively competent layer between the seam and the tunnel roof (ch. 2263 m, Figure II-3.15). Otherwise, the encroachment of the coal seam would increase the rock load on the support system. At ch. 1420 m (Figure II-3.12) where the McRury seam is only about 1 m above the roof, interconnection of the overstressed zone in the coal and the underlying layer was noted from the displacement data at ch. 1428. Over the haunch area, the failure zone in the seam was generally confined.

(c) There is general consistency between the results of the analyses and the observed conditions in the tunnel which are further discussed in the following sections.

II-3.3.2 Rock Failure Mechanism

In addition to the effects due to stress changes around the excavation, the dip of the strata relative to the tunnel alignment and the interbedded nature of the mixed sedimentary sequence through which the tunnel was driven further influenced the stability of the rock strata. It is considered that the rock failure as observed in the tunnel is occurred in the following manner.

As the TBM advanced through the rock strata, stress redistribution would occur around the tunnel due to the creation of the opening. The rock close to the advancing face would still be subjected to the restraint from the three dimensional effects of the face. As the face moved forward, the restraints were gradually reduced and stress redistribution continued. It may be shown theoretically (Niwa et al 1979) that when the face is about one tunnel diameter away, the stress redistribution around the tunnel is about 90 percent complete. If the rock mass strength, as defined by the failure criteria described previously, was insufficient to sustain the new state of stress at any stage during stress redistribution, failure would be imminent. At the crown of the tunnel, where the stress condition was most critical, localized failure would be most likely. Once failure was initiated, rock loosening would occur. This would be further enhanced by the feather edge effect brought about by the low-angle intersection of the strata with the tunnel alignment. Within the first 8 m of the face, the rock was unsupported because of the configuration of the TBM. Rock failure would manifest itself by progressive spalling and subsequently breaking away due to gravitational effects. The intensity of the spalling would depend on the initial overstressed zone and the stratigraphy encountered at the crown.

In areas where tensile overstress occurred, tensile fractures would likely develop. However, because of the limited extent

and location of the overstressed zones, (where gravitational effect was less critical) failure would be restrained and hence very much subdued.

After the tunnel support was installed strata deformation would still continue because of the flexibility of the ring beam itself and the clearance provided in the sliding joint or spacer block (see Table 5.1 in Volume I) for the ring beam to deform. As the rock load was gradually transferred to the support, rock support interaction would take place. During this process, the rock displacement and the support pressures would gradually stabilize until an equilibrium condition was reached. This condition was reflected in the pressure cell data from the instrumented ring beam and the displacement data from nearby extensometers.

II-3.3.3 Rock Failures Observed in Tunnel No. 2

Actual observations made in tunnel No. 2 are consistent with the failure mechanism described above. In the siltstone and interbedded sandstone siltstone layers, the loosened rock fragments at the crown of the tunnel were generally in the form of thin slabs or plates of about 150 to 300 mm in length and about 100 mm in thickness. Occasional larger pieces of up to 600 mm in length were noted.

In areas where mudstones were encountered, the rock fragments from the loosened zone were substantially smaller and more crumbly. Where a coal seam was encountered within 2 m of the back, fracturing of the seam was more uniformly distributed in the layer. The extent of the loosened zone was generally limited to the 60° arch at the crown with the depth of loosening gradually decreasing towards the edge of the zone.

At the invert of the tunnel, floor heave was recorded by extensometers and surficial spalling at the invert was observed. This localized overstressing was not of significance

in the current TBM drivage as the tunnel was backfilled with tunnel muck to about 1.1 m above the invert behind the first trailing skid.

No obvious rock failure was observed on either sidewall over the area extending from about 60° above to 60° below the springline where localized zones of tensile overstress were identified from the analyses.

II-3.3.4 Implications of Field Observation and the Results of Analysis

It was noted from the analyses that shear failures in the coal seam were very extensive if located close to the excavation boundary. At ch. 1420 m where the first major coal seam was located at about 1 m above the tunnel roof, considerable rock displacement and high support pressure was recorded. The zone of loosening was estimated to be about 2 to 2.5 m. The ring beam also exhibited large deformations partly because the sliding joint (see Table 5.1 in Vol. I) at the crown segment of the ring beam started to close as the rock load was sufficiently large to overcome the friction along the joint.

Based on the experience at this location, the ring beam spacing was reduced from 1.5 to 1 m in areas where subsequent coal seams came within 2 m of the roof of the tunnel. This included the Emery, the Phalen and the Harbour Seams. The 1 m spacing was terminated where the top of the seam was within 1 m of the roof.

The stability of the rock mass as observed in the tunnel was positively influenced by the fact that the Lovat TBM caused minimal disturbance to the exposed tunnel surfaces. The Lovat TBM thrusted off the tunnel support system which transferred the machine thrust over a relatively long length of tunnel via a series of total circumferential contacts

(between the ring beam and the rock). In conventional open tunnelling machines which thrust off a set of gripper pads on the tunnel surface close to the face much of the thrust of the machine must be absorbed by the tunnel wall rock on which the pads are set. In weak rocks, the gripper pads tend to penetrate the rock creating a series of imprints of crushed material on the wall which disturbs the circular cross-sections and hence stability of the tunnel.

II-4 ANALYSIS OF ROCK SUPPORT INTERACTION

II-4.1 General

A total of four sets of ring beams were instrumented to study the aspect of rock-support interaction in tunnel No. 2. The type of instruments used included pressure cells to measure the axial and normal pressures on the ring beam as well as strain gauges to monitor the strains on the web. Reference points were installed on the rock and the ring beams to measure convergence, but the measurements were limited by access and were of limited accuracy (see discussion in Volume I). Detailed descriptions of the instruments and their positions on the ring beam are presented in Volume I.

The ring beams at the instrumented stations were spaced at 1.5 m centre to centre. While the ring beam sections were the same for all the stations, there were minor differences in some of the features of the support components and associated structures attached to the support. Table I-5.1 presents the details of the butt joint components at different areas along the tunnel and the observed performance of the support system. The special features of the support system at the instrumented arrays are summarized in Table II-4.1.

II-4.2 Review of Support Installation Sequence

In order to provide a basis for the consideration of rock-support interaction and the interpretation of the data obtained from the measurement, a review of the support installation sequence during the TBM drivage is presented below.

The support system for the TBM drivage comprised ring beams each of which consisted of six segments bolted together at each end. The ring beam segments were initially assembled within the TBM shield. (The ring beam was designed to fit the inside diameter of the shield to facilitate assembly).

There would only be about 50 to 75 mm clearance left at the top after the segments were fully assembled. Such clearance was intended to allow for the insertion of wire mesh panels between the shield and the ring beam. With the additional thickness of the pressure cells on the outer circumference and at the springline of the ring beam, the clearance would be further reduced. In one occasion, one of the axial pressure cells at the springline was removed to allow room for the assembly of the complete ring. Because of the small clearance allowance, the instrumented ring beams would be subjected to some stresses during the assembly stage. This was generally reflected by the readings from the instruments.

When the TBM started to advance the pushing ring (see Figure I-5.3 in Volume I) would be bearing on the flanges and webs on the in-bye side of the ring beam such that the thrust from the TBM was fully transmitted to the support system. During this stage of machine propulsion, the ring beam would be sliding on the bottom and the side of the shield as the TBM advanced forward. Even though the pressures in the hydraulic rams were uniformly applied eccentric thrust load could result due to the flexibility of the support system. (See Figures C.23 to C.98 in Appendix C). This would create some out-of-plane bending in the ring beam. Vibration of the ring beam was also experienced while the TBM was advancing. After completion of the push, the loading rams were retracted in preparation for the second push. At this stage, the instrumented ring beam would be located at the edge of the shield and the mesh panel and steel lagging (as required) would be installed to provide support for the rock as the ring beam was extruded from the shield in the subsequent push.

When the TBM advance resumed, the instrumented ring beam would be slowly extruded out of the shield and in contact with the rock primarily over the lower half of the beam due

to the difference in the inside diameter of the shield and the excavated diameter of the tunnel. When this push was completed, the instrumented ring beam would be about 8 m from the face. The ring beam was then expanded by means of a hydraulic jacking system known as a "rib expander". To facilitate expansion of the beam and to maintain good contact between the beam and the rock after ring beam expansion, several different details were used at the butt joint connecting the top and adjacent segments. The observed performance of butt joint components is summarized in Table I-5.1.

From the time the ring beam was assembled inside the shield to the time when the support was completely installed, the ring beam would have gone through cycles of transient but dynamic loading and unloading as well as a certain amount of bending. The ring beam was also slightly "prestressed" as a result of the expansion process to keep the beam in close contact with the rock. It was noted, however, that in general, the contact at the crown segment was not as close as that in other segments due to the way the "rib expander" was configured.

Because of the machine thrusting methodology, rock-support interaction did not occur until the ring expansion was complete. During this period of machine advance, the external stresses applied on the ring beam were quite variable. In order to study the effects of the rock load on the support system, it was appropriate to consider the changes in the instrument readings only after the ring beam was expanded. Due consideration should also be given to the effect of ring beam pinning (see section 5.2 in Volume I) on the measured data especially those related to thrust block loading.

II-4.3 Measured Data on Rock-Support Interaction

The data obtained from the ring beam instrumentation program was presented in Appendix C. Static and dynamic stresses induced during handling, TBM thrusting and ring beam expansion caused some fluctuations in the instrument reading and some malfunctioning of the instruments. The general observations in regard to the measured data are discussed below. Further discussion of the data obtained at each array is presented in Section 4.5 where measured and computed data are compared.

a. The axial stresses in the ring beam were measured by means of pressure cells placed at the butt joint at the springline location. The axial stresses were measured over a 150 mm x 150 mm area. This pressure has to be multiplied by a factor of 8.15 (ratio of area of end plate to cross sectional area of the beam section) to obtain the corresponding stress in the beam cross-section.

   It may be noted from the results (Figure C.147 to C.162 in Appendix C) that the ring beams were subjected to substantial changes in axial stress prior to the expansion of the ring beam. At the moment when the ring beam was expanded, the axial pressure increased. It then decreased slightly as the "rib expander" was released due to relaxation of the system. As the rock load was transferred to the ring beam, the axial stresses gradually increased and stabilized when equilibrium conditions were reached.

b. In general, the axial pressures measured on two sides at the springline differed slightly due probably to slight eccentricity in the applied load. One of the two axial pressure cells at chainages 1420 and 3353 was out of range, but based on the trend of the reading in the remaining axial pressure cell on the same ring beam, the stabilized reading can be estimated by extrapolation.

c. The axial stresses in the ring beam measured at ch. 985 m, where the tunnel was driven through the sandstone strata, were less than those measured in the other three arrays which were installed in the mixed sediments. The implication is that the load imposed on the support system was considerably higher in the mixed sediments. This is consistent with the observed rock displacements and the extent of rock loosening at the crown of the tunnel. The measured axial stresses in all the instrumented ring beams were below the allowable compressive stress (180 MPa) of the ring beam section.

d. The radial pressures (stresses) measured by the curved pressure cells at the rock/ring beam interface were generally very low at the crown segment with the exception of the one at ch. 3353. In general, the rock - ring beam contact at the crown was not as uniform as those at other pressure cell positions on the circumference of the beam. This is primarily due to the fracturing (spalling) of the rock in the immediate vicinity of the crown. As the pressure cell on the circumference of the ring beam are contact pressure cells which can only sense pressure applied over the area of the cell, the interlocking of the fractured rock fragments might have prevented direct contact. On the other hand, if a rock fragment happened to be positioned directly on the pressure cell, the measured data would reflect the localized pressure which might be very high because the load was applied over a limited area.

In a manner similar to the response of the axial pressure cell, there were fluctuations in the radial pressure cell readings prior to expansion of the ring beam. Thereafter, the pressure gradually increased to a stabilized value.

In general, the stresses sustained in the ring beam were partly influenced by the rigidity of the support system.

Within the mixed sediments, the crown segment of the instrumented ring beams at ch. 1420. 1831 and 3353 m were in ascending order of rigidity because of the different components at the crown butt joints (see Table I-5.1). At chainage 3353, there was little allowance for displacement to occur at the butt joint whereas at chainage 1420 and 1831 m, the butt joints were allowed to displace up to 210 and 50 mm respectively. Consequently the rate of increase in stresses was faster at ch. 3353 m.

e. Prior to expansion of the ring beam the variations in loading were greatest. It was also subjected to bending about its minor neutral axis during machine propulsion because the plane of the ring beam was not normal to the axis of the tunnel. Hence, the measured strain data represent the cumulative strains resulting from a variety of loading conditions.

The strains measured in the ring beam are mostly compressive except at ch. 984 m. This trend of compressive strains in the ring beams is consistent with the pattern of axial and radial pressures measured. The magnitude of the strains varied but are generally below 600 micro-strains with the exception of several localized positions where higher strains were recorded.

II-4.4 Analysis of Rock Support Interaction

II-4.4.1 Approaches in Rock-Support Interaction Analysis

Various approaches have been used in the analysis of rock support interaction. The simplified rock-support interaction analysis suggested by Hoek and Brown (1980) assumes that the in situ stress system is hydrostatic ($k = 1$) and there exists a plastic zone around the tunnel. The calculated support pressure is assumed to be uniformly applied in a radial direction. The solution is based on that derived by Ladanyi (1974) and the failure criterion used is similar to that described in Section 3.

Other solutions have also been given by Daeman (1975), Eggar (1974) and Panet (1976). Time affects of tunnel deformation have been considered in the solutions by Gill (1970) Lo and Yuen (1981) for rock exhibiting time dependent deformation behaviour represented by viscoelastic models. Numerical techniques utilizing finite element methods are also available to take into account various anticipated loading conditions and time effects (e.g. Ghazboussi & Ranken, 1984, Voegele et al 1977).

On the basis of the observations made in the tunnel, the measured displacement pattern, and the results of stress analyses presented in Section II-3 of this volume, failure around the tunnel occurred only in the crown and invert of the tunnel. The tunnel boring machine caused minimum disturbance to the surrounding rock mass. Excavation damage, which is often observed at the excavation boundary in drill-and-blast excavations was very limited in extent. Hence, the assumption of a uniform plastic zone around the tunnel in the rock-support interaction models did not appear to be appropriate in this case.

As discussed in Section 4.2, interaction of the rock and the support system did not start until the ring beam made contact with the rock. At this stage, the face was 8 m away and theoretically the elastic displacements would have been completed. The subsequent interaction process arose primarily from time-dependent rock movements.

Rock movements as measured by the extensometers were most prevalent at the crown where rock loosening occurred. Displacement data at the haunch was rather limited but the results indicated very minor movements. The ring beam was therefore primarily subjected to external loading from the weight of loosened rock. This loading configuration is consistent with the field observation and is considered to be realistic in regards to the analysis of rock-support interaction.

Numerical Modelling

In order to study the effect of rock-support interaction under applied loading over a limited area, numerical modelling was considered to be appropriate because such models allow discrete loading conditions to be simulated. As the tunnel research contract only called for a preliminary and limited analysis of the data, a simplified approach was adopted in the rock support interaction analysis.

The numerical model used for the analysis was a two-dimensional finite element model which comprised 24 beam elements which represented the tunnel liner (ring beam). Each of the nodal points on the liner was connected to a "spring element" oriented in the radial direction representing the rock surrounding the tunnel. The modulus of the rock was represented by the stiffness of the spring.

The bar elements representing the liner could transmit axial load, moment and shear while the spring elements representing the rock could only transmit normal load. The sliding joints at the crown segments of the ring beam were not modelled. It was assumed that there was no shear transferred between the liner and the rock (ie. a full-slip interface condition). This assumption was considered reasonable for the interface condition between the ring beam and the rock. However, to prevent ring beam rotation in the numerical solution, two nodal points near the invert of the liner were restrained from lateral displacement. The set-up of the finite element grid is shown on Figure II-4.1.

It should also be noted that in the analysis, the rock load on the support system was assumed to be applied over the four beam elements representing the crown segment of the ring beam (See Table II-4.2). The loading configuration was assumed on the basis of the extent of the loosened zone observed in the tunnel. The intensity of the loading was related to the depth of loosened rock inferred from the displacement measurements.

Time dependent deformations of the rock on the sidewall and invert of the tunnel were not taken into account by the model. It was anticipated that the load imposed on the support due to such effects was relatively small.

II-4.4.2 Input Parameters and Cases Studied

The input parameters for the analysis included:

- o properties of the ring beam,
- o properties of the rock, and
- o applied loads on the beam element

The properties of the ring beam included the cross-sectional area, the moment of inertia and the deformation modulus of the I-beam section. The rock properties included the deformation modulus and Poisson's ratio. A summary of the input parameters is shown in Table II-4.2.

The applied loads on the beam elements varied between different ring beam arrays. The depth of the loosened zone at the position of the instrumented ring beam was estimated on the basis of the measured displacement distribution recorded in the near-by extensometers. Based on field observations, it was anticipated that the loosened zone was thickest at the crown line and then gradually reduced in thickness towards the edge of the area of loosening. Two loading configurations were studied in this analysis.

Load Pattern A: uniform loading across the two central beam elements. The loading then gradually reduced to 10 percent of the maximum loading over the length of the adjacent elements.

Load Pattern B: uniform loading across the four beam elements.

The applied loading was based on a ring beam spacing of 1.5 m along the length of the tunnel. These loading configurations are illustrated in Table II-4.2.

II.4.4.3 Results of Analyses

The numerical model described above simulated the loading condition on the ring beam and enabled evaluation of the axial stresses in the ring beam, the radial stresses at the ring beam/rock contact, and the bending moments and displacements in each of the beam elements. Typical results of the analyses are described below.

Axial Stresses

The axial stress in the ring beam is presented on Figure II-4.2 for Loading Pattern A. The axial stress is normalized by the applied rock pressure (q) at the crown of the tunnel. Due to the symmetry of the applied loading, the axial stress is uniform in the ring.

Radial Stresses

The radial stresses at the interface of the ring beam and the rock are presented in Figure II-4.3 for Loading Pattern A. The radial stresses are normalized by the applied pressure at the crown. It should be noted that the crown surcharge is applied over a distance of 1.5 m along the tunnel whereas the radial stresses shown represent the contact stresses at the rock and ring beam interface. Based on the imposed loading condition, the radial stresses are low at the crown elements because as the crown segment of the ring beam deforms under the applied loading, the ring beam tends to separate from the excavated rock surface. In the numerical model, the rock is not able to sustain any tension. Hence, the radial stresses become zero. In practice, it was observed that the rock-ring beam contact at the crown was not tight due partly to the interlocking of the fractured rock and partly to the initial ring beam expansion. The load from the rock was transferred from the wire mesh panels and laggings spanning between the ring beams.

Bending Moment

The bending moment in the ring beam for Loading Pattern A is shown on Figure II-4.4. The bending moments were evaluated for crown surcharge of 4 and 94 kPa. Negative moment shown on the Figure stands for "sagging" moment as per normal structural conventions. It should be noted that at very low surcharge loading, the bending moment on the beam would be small. As the surcharge increases, the bending moment in the ring beam increases but due to confinement from the surrounding rock, only the top part of the ring beam (the part above the springline) is subjected to bending. Below the springline there is negligible bending in the beam.

The strains at any point in the beam due to bending were evaluated in accordance with the following expression:

$$\varepsilon = \frac{My}{IE}$$

where M = bending moment (N-mm)
y = distance of the point from the neutral axis of the beam (mm)
I = moment of Inertia of the beam section (mm^4)
E = deformation modulus of steel (MPa)

Displacement of Ring Beam

The resulting displacements due to the rock load surcharge are illustrated on Figure II-4.5 for Loading Pattern A. The displacement is maximum at the crown and gradually reduces as the distance from the crown line increases. The displacements at the crown segment are essentially downward. Below the haunch, the displacements are very small and essentially

outwards. As the loading is symmetrical and linear elasticity is assumed, the displacement at the crown line (point C on Figure II-4.5b) varies linearly with the surcharge pressure.

II-4.5 Comparison of Measured Data with Results of Analyses

II-4.5.1 General

In this section, the results of the numerical analyses are compared with the measured data. The intent was to assess whether the numerical model would have been useful as a design tool to evaluate the adequacy of the TBM excavation support system for the rock conditions at Donkin-Morien prior to construction.

It should be noted that in the analysis symmetrical loading cases were assumed because it was not possible to precisely determine the distribution of the loosened zone from the crown position to the edge of the zone. It is recognized however that the rock load may be eccentric with respect to the centreline of the tunnel.

As discussed in Section II-4.3, the ring beam would have undergone cycles of stresses and strains during assembly and TBM thrusting, all prior to its final installation against the excavation surface. In order to interpret the response of the support system to the rock load, it is appropriate to consider the changes in the instrument readings only after the support system was fully installed. Hence, in the following comparison of rock-support interaction, the measured data are referenced to the time at which the ring beam was expanded in place.

II.4.5.2 Axial Stresses in the Ring Beam

The calculated axial stresses in the ring beam based on the two loading cases are shown on Figure II-4.6 with the average axial ring stresses plotted against the maximum extent of crown surcharge (q). The maximum extent of the loosened rock (above the crown) corresponding to the maximum crown surcharge pressure is also shown as a separate horizontal axis in the plot.

The ranges shown for each loading case represent the variations in axial stress due to variations in the modulus of the surrounding rock (stiffness of the interacting medium). It may be noted that there is only a slight variation in the axial stress over the range of deformation modulus possible for the rock types encountered at the instrumented sections. For a given rock loading condition, the axial stress in the ring increases with an increase in the modulus of the surrounding rock. This is entirely consistent with the usual characteristics of rock-support interaction.

For comparison purposes, the final axial stresses measured at the springline butt joints at each of the instrumentation arrays are summarized in Table II-4.3. The depth range of the loosened rock at the crown shown in the Table was estimated on the basis of the displacement distribution graphs (Figure II-3.5 to II-3.10) obtained from the extensometers installed nearest to the instrumented section. At chainage 925 m where the extensometer data was not reliable, the depth of loosened rock was estimated on the basis of field observation.

These results are presented on Figure II-4.6 where the average axial stresses measured in the ring beam were plotted with the estimated range of loosened rock (see Table II-4.3). It is noted that all the measured data falls within the range of axial pressures computed by the numerical model. On the basis of the results shown on the plot, the measured data

generally indicates that loading pattern A is the more likely load distribution from the loosened rock. This is consistent with the assessment based on field observations. The only variation is the data measured at ch. 3353 m which shows that the measured axial stress corresponds more to Loading Pattern B for the estimated depth range (2.0 - 2.5 m) of loosened rock at the crown. However, if graph A is considered to be generally representative of the loading condition at the crown of the tunnel, the corresponding maximum depth of loosen rock at ch. 3353 m would be of the order of 2.5 to 2.8 m. This is still within the possible range of loosened rock for the type III-IV material.

The above comparisons provide a good calibration of the numerical model in that the axial stress data is least affected by factors related to the propulsion of the TBM and the contact at the interface of the ring beam and the rock. The data suggests that the graphs shown on Figure II-4.6 provided a reasonable relationship between the axial stress in the ring beam and the anticipated rock load. Similar graphs can be developed for other beam sections and other loading patterns.

II-4.5.3 Radial Stresses in Rock

On the basis of the data from the axial stress measurement, it is considered that for the purpose of the rock-support interaction analysis, graph A on Figure II-4.6 was reasonably representative of the loading condition and the measured rock response.

This graph was therefore used for interpreting the crown surcharge from the measured average axial stresses in the ring beam. For example, at ch. 1831 m, the measured average axial stress is 62 MPa (see Table II-4.3). At this axial stress level, the corresponding average crown surcharge based on Loading Pattern A on Figure II-4.6 is 73 kPa. This

surcharged was used as the input parameter for the computation of the radial stresses and bending moment in the ring beam. The input crown surcharges for analyzing the instrumented arrays are summarized below:

Chainage (m)	Input Crown Surcharge for Rock-Support Interaction Analysis (kPa)	
984	6	)
1431	79	)Based on Loading
1831	73	)Pattern A
3353	104	)

The computed and net measured radial stresses at the positions of the pressure cells are presented in Table II-4.4 to II-4.7 for instrumentation arrays T2-1 to T2-4 respectively. The net measured stress was calculated by taking the difference between the stabilized instrument reading and the reading taken immediately after the ring beam was expanded.

Chainage 984 m

At chainage 984 m the computed radial pressures are low, being in the range of 30 kPa. Pressure cell SC5 did not function properly. The crown pressure cell, SC1, registered no pressure as anticipated. The rest of the pressure cells generally indicated low readings except SC3. It is noted from the raw data that initial stabilization occurred when the face was at ch. 1254 m, about 270 m from the instrumented section. These readings are shown in column C in Table II-4.4. However for some reason, the readings started to increase when the face advanced further. The final stabilized readings taken in November 1984 are also presented in the same Table. The isolated high radial stress at SC3 was probably due to localized contact of the pressure cell with the rock.

Chainage 1423 m

At chainage 1423 m, pressure cell SC5 suffered considerable variation during the course of monitoring and there are also significant changes in the last two sets of readings (see Appendix C). For comparison purposes, the set of readings taken on September 23, 1984 (when the face was at ch. 2413 m) was used. The measured and computed radial stresses are presented in Table II-4.5.

The radial stress at the crown was again negligible as anticipated. The non-uniformity of radial stresses result from different degrees of contact at the pressure cell positions and probably some eccentricity in the rock loading. However it is noted in the following summary that the sum of the radial stresses were approximately symmetrical with respect to the vertical centre line of the tunnel and the average measured and computed sum of radial stresses on each side of the centreline are in good agreement.

	Sum of radial stress at SC5 and SC6 (Left of ℄)	Sum of radial stress at SC2 & SC3 (Right of ℄)	Average radial stresses at positions SC2 to SC6
Measured	750 kPa	780 kPa	362 kPa
Computed	710 kPa	710 kPa	350 kPa

The above also indicate that there is good agreement between the measured and computed average radial stresses at position SC2 to SC6.

Chainage 1831 m

For the array at ch. 1831 m, the instrument readings were not uniform around the ring beam but there was some degree of symmetry (diametral symmetry: SC2 - SC5 and SC3 - SC6) in the pressure cell readings. This is by far the most consistent set of pressure cell data among the four arrays. The measured and computed radial stresses are presented in Table II-4.6 and a comparison of the individual and sum of radial stresses on each side of the vertical centreline is as follows.

Some pressure was measured at the top segment due probably to loosened rock fragments resting directly on SC1. The pressure at the invert was higher than that at other positions. A comparison of the measured and computed sum of radial stresses on each side of the vertical centreline and the average measured and computed radial stresses of positions SC2 to SC6 is as follows.

	Sum of radial stress at SC5 and SC6 (Left of ℄)	Sum of radial stress at SC2 & SC3 (Right of ℄)	Average radial stresses at positions SC2 to SC6
Measured	540 kPa	510 kPa	304 kPa
Computed	655 kPa	655 kPa	323 kPa

Symmetry of the sum of radial stresses is noted but the computer values are slightly higher. The results also indicate good agreement between the average measured and computed radial stresses at positions SC2 to SC6.

Chainage 3353 m

At this location, the pressure cell at the crown segment was subjected to a pressure of 470 kPa (see Table II-4.7). This was probably due to a localized direct loading on the pressure cell. Expressed in terms of loosened rock, this pressure is equivalent to about 2.8 m of material over the load cell. High radial stresses were also recorded at the invert. A comparison of the measured and computed sum of radial stresses on each side of the vertical centreline and the average measured and computed radial stresses at positions SC2 and SC6 is as follows:

	Sum of radial stress at SC5 and SC6 (Left of ℄)	Sum of radial stress at SC2 & SC3 (Right of ℄)	Average radial stresse at positions SC2 to SC6
Measured	950 kPa	440 kPa	370 kPa
Computed	936 kPa	936 kPa	462 kPa

There is no symmetry in the sum of the radial stresses as observed in other arrays and the computed average radial stresses are higher than the measured values.

The results indicate that the applied loading may be eccentric probably due to the localized loading affects and the actual loading may not be as severe as that inferred from the measured axial stress.

Further Discussions

In summary, the measured and computed radial stresses at the ring beam rock interface are of the same order of magnitude. The sum of the measured radial stresses (at positions SC2, SC3, SC5 and SC6) are generally symmetrical with respect to the vertical centreline of the tunnel. The contact pressure at the crown segment depends on whether there is direct contact between the loosened material and the ring beam.

It is of interest to note that the butt joints at the crown segment in each of the instrumented arrays in the mixed sediments have slightly different design features (see Table I-5.1). The ones at ch. 3533 m had the least clearance for changes in the circumferential dimension of the ring beam whereas the sliding joint at ch 1423 m allowed circumferential movements (closures) of up to 210 mm when the sliding joint closed. The clearance for circumferential movement at ch 1831 m was limited by the spacer blocks and was intermediate (50 mm) between the other two. Based on the magnitudes of the radial stresses measured at the crown segment at these three stations, it appears that a relatively more "rigid" support (at ch 3533 m) resulted in better rock-ring beam contact at the crown segment.

In the case where the circumferential dimension of the ring beam was allowed to change by a significant amount (as in the case at ch 1431 m) the decrease in the circumferential dimension of the beam would be translated into vertical displacements. Such beam displacement would allow the loosened rock fragments at the crown to re-orientate and interlock. The wire mesh supporting the loosened rock would likely sag by a larger amount because the ends of the mesh panel were not tightly restrained by the ring beam. In turn, the ends of the mesh might tilt slightly and prevent good contact between the rock and the beam. The total rock load would still be transmitted to the rig beam but the radial stress at the crown segment would be low.

This loading mechanism is reflected in the results at ch. 1431 and 3353 m. While the average measured radial stresses at position SC2 to SC6 at these two arrays (T2 and T4) are approximately the same there is substantial difference between the radial stresses measured at the crown segments at these two stations. The simplified numerical model used for the analysis is limited in taking this loading mechanism into account.

Both the measured and computed results indicated that the loading on the support system was substantially less in the sandstone than in the mixed sediments. The agreement between measured and computed radial stresses at individual pressure cell positions was only fair due to non-uniformity of contact at the interface. However, there is reasonable agreement between the overall average of the measured and computed radial pressures at the positions of pressure cells SC2 to SC6.

II-4.5.4 Strains in Ring Beam

The strains in the ring beams were computed from the axial stresses and bending moment in the beam (using the formula given in Section 4.4.3). The loading configurations used for computing the strains are the same as those for the evaluation of the radial stresses. The computed and net measured strains in the ring beams are presented in Tables II-4.8 to II-4.11 for instrumentation arrays T2-1 to T2-4 respectively. The net measured strains were calculated by taking the difference between the stabilized instrument reading and the reading taken immediately after the ring beam was expanded.

As the strain gauges are designed to measure very minute movements on the web of the steel sets, they are very sensitive to the different types of external loading that might be imposed on the ring beam. They are also susceptible to damage due to vibrations. As a result, there are large variations between successive gauge readings and fluctuations in individual readings were also noted. Readings that are not considered reliable or have shown considerable fluctation are noted in the summary tables.

The numerical model predicted compressive strains at all the positions of the strain gauges. While the results from ch 1423, 1831 and 3353 showed compressive strains, some

tensile strains were recorded at ch. 984. This is probably due to the low axial stresses in the ring beam and some bending induced in the ring about its minor axis.

In general, there is a considerable discrepancy between the measured and computed strain values although they are of the the same order of magnitude.

The lack of agreement underlines the difficulties in predicting strains with the current numerical model. Factors such as vibration effects, out of plane bending, loading eccentricity which would significantly affect the strains in the ring beam were not considered in the analysis. Nonetheless, the computations did indicate the range of strains to be anticipated in the ring beam due to rock load alone.

II-4.5.5 Displacement in Ring Beam

Vertical displacement in the ring beam was monitored at selected locations to check the stability of the support system as part of the geotechnical control for the tunnel drivage contract. The measurement was taken by levelling (accuracy $\pm$ 2 mm) with reference to the mid-point on the underside of the crown steel set segment. The first set of readings was generally taken after the trailing package of the TBM has passed the ring beam, when the face was about 200 m away. Hence, the measured displacements do not represent the complete history of ring beam movement.

To illustrate the range of movements recorded in the ring beam during the process of rock support interaction, the total displacements measured at the ring beams closest to the instrumented arrays are summarized as follows:

Measured Ring Beam Displacement			Computed Ring Beam Displacement		
Chainage of ring beam	Total measured displacement	Distance from face when first set of reading was taken	Chainage of Instrumented ring beam	Computed max. Displacement*	Crown Surcharge(**) (%)
1422 m	8 mm	188 m	1431 (T2-2)	14 mm	79 kPa
1827 m	4 mm	180 m	1831 (T2-3)	13 mn	72 kPa

* See Figure II-4.5b ** Load pattern A.

It may be noted that the measured displacement are within the range of anticipated displacements in the ring beam.

II-4.5.6 Summary

The data obtained from the four instrumented arrays in tunnel No. 2 have been examined and compared with the results computed from a simplified numerical model. The results of the comparison are summarized below:

- The model provides a reasonable assessment of axial stresses in the ring beam for the loading configuration inferred from the displacement measurements and field observations.

- The model indicates a fairly uniform distribution of radial stresses at the contact of the ring beam and the rock below the crown segment. The measured radial pressures are generally non-uniform and dependent on the contact condition. The rigidity of the butt joints segment affects the ring beam - rock contact and hence the resulting radial presence at the crown. The sum of the measured radial stresses are generally symmetrical with respect to the vertical centre line of the tunnel. The

overall average of the measured and computed radial stresses at position SC2 to SC6 agree reasonably well.

- The computed and measured strains in the ring beams are consistent with respect to order of magnitude and overall trend. There are considerable discrepancies between the measured and computed strains at individual strain gauge positions.

- The displacements measured at some of the ring beams located close to the instrumentation arrays were within the range of the computed ring beam displacements.

In the overall context, the numerical model used provides a reasonable assessment of the performance of the ring beam but it is very limited in simulating the fine details of the loading mechanism. It did not simulate for example the effect of the rigidity of the butt joints at the crown segment and the effects of out of plane bending of the ring beam.

II.5 ANALYSIS OF THRUST BLOCK LOADING

The short and long term plots of the thrust block loading with time are presented on Figure C.23 to C.98 in Appendix C. The most comprehensive set of results was obtained from chainage 984 m where 18 of the 24 thrust blocks were strain gauged.

The general observations made from the results of the thrust load monitoring are summarized below.

(a) The loads on the thrust blocks were not uniform. They were dependent upon the position of the thrust blocks and the number of hydraulic rams used at the time of thrusting. In general, the loads on the thrust blocks located below the springline were higher because the TBM thrust was concentrated on the lower half of the machine to maintain the alignment of the drivage especially along the -10% and -20% slopes (for approximately the first 1200 m of tunnel).

Figure II-5.1 shows the distribution of the maximum thrust block loading during TBM thrusting at ch. 984 m. The loading rams used for thrusting are listed on the same figure for reference. Loadings in those thrust blocks that were not strain gauged were assumed by interpolating the measured loads in adjacent thrust blocks. Where only one strain gauge was functioning in the thrust block, the load was calculated by assuming that both gauges registered the same reading as the working gauge.

(b) All the thrust blocks were subjected to compressive loads which were generally eccentric especially when the ring beam was coming out of the shield.

(c) The thrust loads responded closely to the on-load and off-load sequences of the TBM, that is, the entire system behaved as an elastic spring.

(d) The loads on the thrust blocks gradually reduced as the TBM advanced but maximum load in the thrust block might not necessary occur at the time when the push ring was in contact with the ring to which the instrumented thrust blocks were connected.

Table II-5.1 summarizes the maximum load in each thrust block, the chainage of the face at which the maximum load occurred, and the residual load after equilibrium condition was reached.

It may be noted from the summarized data that the thrust loads became approximately constant when the face was about 20 to 45 m away. The amount of load reduction ranged from 30 to 60 percent of the maximum load. At chainage 984 m, the residual load became almost zero when the ring beam at ch. 1020 m was pinned to prevent rotation of the ring beam during thrusting. This procedure resulted in almost complete dissipation of the thrust loads. That is, the pins around the ring beam sustained all the loads transferred from the TBM. At the two other locations where no pinning of the ring beams in the vicinity of the instrumented sections were undertaken, the residual loads are higher but generally below 350 kN.

(e) During TBM thrusting, some of the thrust blocks located below the springline was temporarily loaded beyond the allowable capacity of the thrust block of 540 kN. This transient overloading did not appear to cause any distress in any of the thrust blocks. All the residual loads in the thrust blocks are substantially below their allowable capacity.

II-6 ANALYSIS OF PERFORMANCE OF DRILL-AND-BLAST DRIVAGE

II-6.1 General

As indicated earlier in the report, the drill-and-blast section of tunnel No. 3 in the sandstone was completed prior to the commencement of the tunnel research contract. Hence there was very limited data from the extensometers in tunnel No. 3 as they were installed after completion of the excavation. The only information on tunnel displacements is available from the convergence measurements carried out as part of a separate geotechnical monitoring program to ascertain tunnel stability during drivage.

The analysis of the performance of tunnel No. 3 is therefore limited to an examination of the measured convergence and the observed support performance and the excavation tolerances in the tunnel.

A total of seven full arrays of convergence points were installed in tunnel No. 3 between chainage 150 and 920 m. The type of convergence points and the measuring instrument used are described in section I-6 in Volume I. Typical layout of the convergence points in an array is shown on Figure I-6.8. The convergence points were generally installed within 1.2 to 3 m from the face (see Table II-6.1) and readings were taken as the face advanced. Rock bolts were generally installed within 1.5 m of the face and shotcrete was applied when the face was at varying distances from the instrumented section depending on the rock conditions and the contractor's shotcreting schedule. Table II-6.1 summarizes the distances between the face and the instrumented sections when the convergence arrays, and the rock support (including rock bolts and shotcrete) were installed.

The installed shotcrete thickness (checked by probe holes), the number of rockbolts installed, the observed conditions of the shotcrete and the measured average overbreak in the excavated profile of the tunnel at each of the convergence array stations are summarized in Table II-6.2. The convergence data is presented in Appendix C-5. The performance of the drill-and-blast excavation and a preliminary interpretation of the convergence data are presented in the following sections.

II-6.2 Performance of Support and Excavation Tolerances

The support design for the drill-and-blast section of tunnel No. 3 was described in Vol. I of the report. The performance of the rock support components and the excavation tolerances are discussed below.

Shotcrete

Dry mix shotcrete was used throughout the drivage. Water heated to between 40-50 C was used to accelerate the setting time and the result was generally satisfactory. The installed shotcrete was checked by drilling 38 mm dia. probe holes through the shotcrete and by sounding the shotcrete surface with a hammer.

In general, the shotcrete was sound and ahesion to the rock surface was satisfactory. The applied thickness was however quite variable. The average rebound was about 30%. The applied and specified minimum thickness at the instrumented stations are shown in Table II-6.2. At locations where the shotcrete was less than 25 mm in thickness, minor cracking and drummy areas were noted at isolated spots. These areas were either removed (if practical) or reinspected on a

regular basis. The condition of the shotcrete at the instrumented stations was generally sound except at ch. 798 m where drummy areas were noted.

In most cases, shotcrete was applied at some distance back from the face if the rock condition was such that there was little potential for spalling to occur between the installed rockbolts. Otherwise, either mesh would be installed and shotcrete was applied at a later stage, or, shotcrete would be installed close to the face to provide immediate support (as in the case at chainage 918 m).

Rock bolts

Rock bolting was carried out with no major problems throughout the drivage. 25 mm diameter 3.5 m long rock bolts were used except at an isolated locations where the contractor used 2.5 m bolts at closer spacing. The rock bolts were installed with fast and slow resins and pretensioned to 12 tonnes as described in Section I-5.1.

During the initial stage of the project, some delays arose from the slow setting of the fast set resin cartridges (about 20 minutes) due to low ambient temperature in the tunnel especially at locations close to the portal.

There was no anchorage problem in the sandstone unit. Installed rock bolts were selectively proof loaded to 17 tonnes. Very little anchor slippage was encountered. Bolts which failed the proof loading were reinstalled.

Excavation Tolerances

The designed excavation profile of tunnel No. 3 is shown on Figure I-5.2 and typical blast patterns are presented in Appendix A-3. The excavated profile was surveyed following each round and the average overbreak at various positions along the tunnel profile is summarized in Table II-6.2. The

average overbreak varied between 0.38 and 0.46 m with the overbreak at the crown being marginally higher. Blast induced fractures were clearly noticeable on the excavation surfaces prior to scaling.

Tunnel Convergence

In general, the displacements measured across the convergence points in tunnel No. 3 were small. Maximum measured convergence (total displacement of the two sidewalls) occurred across the springline was about 16 mm at ch. 918 m, the station furthest from the Portal. At other stations located up-chainage, the maximum convergence at the springline was lower. The measurements across the points at the crown and the springline generally indicated that there was very small displacement at the crown, being typically less than 5 mm.

In view of the proximity of the convergence arrays to the face, some convergence studs were damaged during excavation even though they were protected by blast protection caps bolted to the tunnel wall. The most consistent set of data was obtained at chainage 918 m. This array was also close to the location where in situ stress measurements (ch. 964 m) and deformation modulus testing (ch. 804 m) were undertaken. A preliminary analysis of the data from this array is presented in the following section to assess the performance of the drill-and-blast drivage in the sandstone unit.

Table II-6.3 summarizes the convergence data across the reference points at ch. 918 m at various time and face distances. A plot of the data is presented in Figure II-6.1. Closure of the tunnel was designated as positive convergence. Typically, the convergence increased at a fast rate when the face started to advance. As the face moved further away from the instrumented section, the rate of convergence gradually

reduced and the displacements approached stabilized values, when the face was about 30 m past. Measurements across the crown and springline convergence points were discontinued after the vent pipes were installed. In the course of time, there appeared to be some minor surficial loosening but the readings subsequently stabilized. The amount of long term change was small.

The following is an evaluation of the elastic displacements at the springline and crown based on a set of parameters obtained from in situ test results.

- In situ stress conditions (Based on in situ measurements at ch. 964 m) — P_v = 4.9 MPa, K_o = 2.5
- Deformation modulus of rock mass (based on in situ testing results at ch. 800 m) — E = 10 GPa
- Poisson's ratio — = 0.25
- Theoretical Elastic displacement at springline — = 7.6 mm (inward) (convergence = 15.2 mm)
- Theoretical Elastic displacement at crown — = 0.6 mm (downwards)

It may be noted that there would be very minor elastic displacement at the crown and relatively larger displacements at the springline. Theoretically, the total elastic displacement would be completed when the face was at two times the width of the tunnel from the instrumented station. At the time when the array of convergence points at ch. 918 m were installed, the face was 1.2 m ahead (See Table II-6.3). It is estimated that 60% of the total

elastic displacement would have taken place. Based on the total elastic displacements presented above, the remaining (40%) portion of the elastic displacement which would take place at the springline and crown after the convergence points were installed would be about 3 mm (convergence = 6 mm) and 0.24 mm respectively.

The measured springline convergence at ch. 918 m when the face was 14 m (two times width of tunnel) past was 10 mm. As the face was advanced further, there was slight increase in the convergence and the movements gradually stabilized. This is indicative of minor time dependent movements, the magnitudes of which, however, were small.

If the displacements at the springline are assumed to be primarily horizontal and both sidewalls exhibited equal displacements, the displacement trend and the vertical displacement components at the crown can be assessed up to the time when the measurement was discontinued.

Face Distance	Displacement at Springline (mm) (1/2 x convergence)	Inferred Vertical Displacement at crown (mm)
1.2	1.4 (inward)	0.7 (downward)
1.5	2.9	2.8 (downward)
4.5	4.1	1.2 (upward)
11	5	- (upward)
14	6.3	0.5 (upward)
28	6.4	-
30	6.8	0.57 (upward)

It is noted that at this location, mesh reinforced shotcrete was applied close to the face. That is, the support system was fully installed prior to further advance of the tunnel. As the face distance increased, the rock at the crown

exhibited slight downward movements followed by very minor upward displacements. The net displacement trend was downwards and stabilization was noted when the face had advanced 14 m. The rockbolt and shotcrete system was effective in providing stability to the excavation.

In summary, the convergence data indicated that the drill-and-blast tunnel had stabilized. Despite the use of controlled blasting techniques, overexcavation occurred almost uniformly around the tunnel due to blast induced fracturing of the surficial rock. The magnitude of convergence measured at the springline at ch. 918 m was consistent with the anticipated stress conditions and rock properties at that location. At the crown of the tunnel, installation of rock support close to the face accounted for the small crown displacement measured.

II-7 COMPARISON OF PERFORMANCE OF DRILL-AND-BLAST AND TBM DRIVAGES

In view of the limited length of drill-and-blast drivage in tunnel No. 3 comparison of the performance in the drill-and-blast and TBM Drivages is only restricted to the portion within the "Portal" sandstone unit. Table II-7.1 presents a comparison of the two excavation methods with regard to the following aspects:

- Length and dimensions driven
- excavation techniques
- installed rock support
- observed stability condition
- measured rock displacement
- excavation tolerance and disturbance
- influence on rock mass properties
- drivage progress rate

Further comments on the comparison are presented below.

It should be noted that the installed rock support for tunnel No. 2 in the sandstone unit was dictated primarily by the thrusting characteristics of the LOVAT TBM. As far as rock support for the sandstone unit is concerned rock bolt and shotcrete (with mesh if required) would have been adequate. In the mixed sediments, rock types IV, V, VI and VIA would likely require heavier support ranging from rock bolts and 100 mm of mesh reinforced shotcrete to possible steel set support adjacent to faulted areas.

The measured displacements in both the drill-and-blast and TBM drivages indicated minor time-dependent movements in the rock mass. The displacements in the two tunnels are comparable, with the rock mass adjacent to tunnel No. 2 registering less movement even though the extensometers for measuring the displacement were preinstalled. Rock movements

in the side walls of tunnel No. 3 might be affected by rock loosening due to blasting.

The finished excavation profile of the TBM drivage is significantly better than that of the drill-and-blast excavation. Figures I-5.3 and I-5.5 illustrate clearly the difference in the finished profile. By thrusting against a series of ring beams behind the shield, the LOVAT TBM has alleviated the imposition of pressures on the side walls from thrusting pads normally used in conventional rock TBM. Consequently it provided a smooth finished profile even when driven through coal and relatively weak mixed sediments such as mudstone.

On the basis of the measured in situ modulus and a detailed study of the fractures in the rock mass between the two tunnels, the excavation disturbance on the rock mass caused by the drill-and-blast method was noticeably higher.

It is also noted that even in the initial stage of TBM driveage when the TBM operators were undergoing a training program, the typical drivage rate was substantially higher than drill-and-blast. On the basis of site records; in the first three months of TBM drivage the average weekly advance rate ranged from 5 - 30 m/week. In the subsequent months when the operation was streamlined the average weekly advance rate increased to about 52 to 72 m/week. In the last three months, the drivage rate (in the mixed sediments) consistently exceeded 80 m/week with the maximum advance rate reaching slightly over 120 m/week. In comparison, the overall average week advance rate in the drill-and-blast excavation in sandstone was about 25 m/week.

In summary the TBM used at Donkin offered a more efficient excavation operation, caused minimum disturbance to the rock mass and provided a better finished tunnel profile as compared with the drill-and-blast method.

II-8 CONCLUSIONS

In connection with the initial phase of the Donkin-Morien Development Project, a tunnel research program was undertaken to study the rock deformation and support system response in the drill and blast and TBM access drivages. The research study included an extensive field instrumentation and testing program, and preliminary and limited analysis of the data obtained. The field work was commenced in May 1983 and was successfully completed in December 1984. Because of the overall project schedule the drill and blast section in tunnel No. 3 was completed before the commencement of the tunnel research contract, and only the TBM excavation was undertaken during the period of the field program. Hence, the field data collected were primarily related to the performance of the TBM drivage. Limited data was obtained in the drill-and-blast drivage but it provided a reasonable basis for the comparison of two different excavation techniques in the sandstone unit. The main conclusions derived from the study are summarized below.

a. In general, the instruments used for the research program performed satisfactorily in the underground environment. The co-operation of the mining crew and operations personnel of the Donkin-Morien Project contributed significantly to the successful installation and monitoring of the instruments in the tunnels.

b. The results of in situ stress measurements in the sandstone unit indicated that the measured vertical stress was about 15 percent higher than the weight of overburden material and the maximum horizontal to vertical stress ratio was about 2 to 3. The success rate of the CSIRO gauge under wet conditions was low.

c. Deformation modulus of rock was determined by laboratory uniaxial compression tests, in situ borehole dilatometer and seismic reflection surveys on the tunnel walls. Of the three methods used, the in situ modulus testing provided the most realistic evaluation of the deformation characteristics of the rock mass. The laboratory values represented the upper bound of the modulus values and they were generally independent of the excavation methods. The seismic surveys provided modulus values intermediate between the laboratory and in situ values. It is apparent from the results of modulus testing and the discontinuity data that the TBM excavation caused minimal damage to the surrounding rock mass. On the other hand, the drill and blast excavation induced fractures and caused a reduction of the deformation modulus in the rock in the immediate vicinity of the tunnel. The zone of excavation damage appears to have extended to about 2 m from the tunnel wall.

d. Displacement measurement during tunnel advance ("Mine-by" test) were undertaken in the sandstone unit by pre-instrumenting from tunnels No. 3 to 2 with multiple-point extensometers. The rock movements responded very well to the tunnelling activities. The displacement changes however were more gradual than theoretically anticipated and the rock exhibited minor time-dependent deformation characteristics. The range of inferred elastic displacement from the measured data is consistent with the elastic displacement computed on the basis of in situ stress conditions and deformation modulus.

e. Displacements around tunnel No. 2 were measured with multiple point extensometers at or behind the face. All the displacements measured indicated inward movements with the crown displacements being predominant. The rate of rock displacement was initially high and gradually

reduced as interaction between the rock and the support system took place. The measured displacements were generally less in types I, II and III than in types IV, V and VI rock.

Approximately 90 percent of the total displacement occurred within the first 0.9 m to 1.7 m of rock at the tunnel crown depending on the stratigraphy. In general, there was relatively little rock movement beyond 3 m above the tunnel crown. Where the coal seam was located about 2 m above the crown very slight movement occurred across the contact of the coal seam and the underlying rock layer.

f. The overstressed zones in the vicinity of tunnel No. 2 were examined by means of stress analyses. The results indicated that shear overstress was limited to the crown and invert of the tunnel, and in major coal seams when they were located close to the tunnel. Minor and limited tensile overstressed zones were also indicated. There was general consistency between the results and the observed conditions. The results of displacement monitoring and stress analysis provided a basis for scheduling the support spacing during the TBM drivage.

g. Rock support interaction was analyzed using a simplified two-dimensional finite element model with beam elements representing the ring beam and spring elements representing the rock. The rock loading configuration was estimated on the basis of the measured displacement pattern and field observations.

A comparison of the measured data and results of analysis indicated that:-

- The model provided a reasonable assessment of axial stresses in the ring beam. Both the measured and

computed results indicated that the rock load on the support system was substantially less in the sandstone than in the mixed sediments.

- The model indicated a fairly uniform distribution of radial stresses at the contact of the ring beam and the rock below the crown segment. The measured radial pressures were generally non-uniform and highly dependent on the contact condition. The rigidity of the butt joints at the crown segment affected the ring beam-rock contact and hence the resulting radial pressure at the crown. The sum of the measured radial stresses were generally symmetrical with respect to the vertical centreline of the tunnel. The overall average of the measured and computed radial stresses, agreed reasonably well.

- The computed and measured strains in the ring beams were consistent with respect to order of magnitude and overall trend. There were considerable discrepancies between the measured and computed strains at the individual strain gauge positions.

- The displacements measured at some of the ring beams located close to the instrumentation arrays were within the range of the computed ring beam displacements.

In the overall context, the numerical model used provided a reasonable assessment of the performance of the ring beam but it was limited in simulating the fine details of the loading mechanism such as that resulting from the rigidity of the butt joints at the crown segment and the effects of out of plane bending of the ring beam.

h. The loads on the thrust blocks were not uniform, being higher below the springline. They were dependent upon the position of the thrust blocks and the number of loading rams used for the thrusting. The thrust load responded closely to the on-load and off-load sequences of the TBM. The initial loads on the thrust blocks were generally high during pushing and gradually reduced to about 30 to 60 percent of the maximum load when the face

was about 20 to 45 m past. The residual loads on the thrust blocks were generally below 350 kN.

Based on a comparison of the performance of drill-and-blast and TBM drainages in Portal sandstone, the TBM offered a more efficient excavation operation, caused minimum disturbance to the rock mass and provided a better finished tunnel profile as compared with the drill-and-blast method.

In the overall context, the research program contributed significantly to the TBM drivage in that the data collected from the instruments were utilized as a basis for scheduling the tunnel support requirements. The data on the support performance generally confirmed the stability of the tunnel. Results of the study on the thrust loads also provided the necessary criterion for reducing the number of thrust blocks used during the drivage.

The preliminary and limited analysis presented in the report is a first step toward a more refined analysis of the rock-support interaction process. It is hoped that the data collected in this study will be used by others and prove to be useful in future tunnel designs.

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TABLE II-2.1

SUMMARY OF DEFORMATION MODULI OF SAMPLES FROM BOREHOLES AT CHAINAGES 800 AND 804 m

ROCK TYPE	BOREHOLE NO.	DISTANCE FROM TUNNEL WALL (m) TUNNEL 2	TUNNEL 3	DEFORMATION MODULUS FROM UNIAXIAL COMPRESSION TEST (GPa)
Sandstone (Type I)	X-hole at ch. 800	20.93	21.05	21.1
		20.89	21.04	21.2
		20.70	21.23	21.3
		20.53	21.40	20.0
		20.44	21.49	20.2
		20.35	21.08	24.1
		11.86	30.07	25.3
		11.77	30.16	20.8
		11.68	30.25	20.8
		3.88	38.05	20.0
		3.80	38.13	19.1
		3.71	38.22	18.4
		1.09	40.84	15.3
		1.00	40.93	27.5
		0.90	41.02	13.8
Sandstone (Type I)	X-hole at ch. 804	40.94	1.07	41.67
		37.94	4.22	32.78
		37.10	4.95	23.26
		34.54	7.19	26.41
		32.07	9.96	25.93
		24.40	17.68	25.72
		19.13	22.96	33.04
		3.76	38.28	29.39
		2.08	40.03	30.59
		2.08	41.93	43.71

NOTE: See Section 7.9 of Vol. I for detailed results of uniaxial compression tests.

TABLE II-2.2

SUMMARY OF DEFORMATION MODULI DETERMINED BY INSITU MODULUS TESTING AT CHAINAGES 803 AND 805 m

DEPTH (m) (1)	DEFORMATION MODULUS (GPa) BOREHOLE AT CH. 803 m (2)	BOREHOLE AT CH. 805 m (2)	BOREHOLE AT CH. 805 m (3)
0.25	-	-	27.39
0.50	7.44	-	25.76
0.75	9.45	-	25.95
1.00	10.22	-	24.67
1.25	8.98	-	20.86
1.50	10.26	-	14.11
1.75	10.83	-	21.13
2.00	9.70	-	24.16
2.25	10.26	-	28.19
2.50	9.70	-	19.72
2.75	9.95	-	19.60
3.00	10.00	-	15.18
3.25	10.50	-	11.99
3.50	11.60	-	11.85
3.75	11.39	-	10.98
4.00	11.65	-	11.36
4.25	10.93	-	11.50
4.50	11.87	-	11.09
4.75	11.80	-	10.53
5.00	11.64	-	10.92
5.50	11.60	10.45	11.11
6.00	18.11	36.68	10.82
6.50	-	26.30	9.90
7.00	19.63	23.76	10.18
7.50	24.69	22.89	11.04
7.97	18.32	-	-
8.00	-	18.76	10.61
8.50	-	9.92	10.42
9.00	-	-	9.08
9.50	-	-	10.57
10.00	-	-	10.61
10.50	-	-	9.79
11.00	-	-	8.89
11.50	-	-	9.87
12.00	-	-	9.95
12.50	-	-	9.64
13.00	-	-	8.78
13.50	-	-	9.78
14.00	-	-	9.80
14.50	-	-	10.00
15.00	-	-	9.70

NOTES: (1) Depths are measured from hole collar
(2) Tests undertaken from Tunnel No. 3
(3) Tests undertaken from Tunnel No. 2

TABLE II-2.3

SUMMARY OF DEFORMATION MODULI DETERMINED BY SEISMIC SURVEYS ALONG TUNNEL NO. 2 AND NO. 3

TUNNEL NO.	CHAINAGE (m)	DEFORMATION MODULUS (GPa)
2	400	23
	610	24
	810	34
3	400	12
	640	19
	810	30

NOTES:
1. The deformation modulus is evaluated from the primary (compression) and shear wave velocities in the rock mass within 2 m of the tunnel wall.
2. See section 7.8 of Vol. I for detailed results of seismic survey.

TABLE II-3.1

SUMMARY OF EXTENSOMETER DATA

TUNNEL NO. 2

EXTENSOMETER REF. NO.	ORIENTATION AND DEPTH OF ANCHORS	EXTENSOMETER INSTALLATION RELATIVE TO FACE	MAX. SURFICIAL DISPLACEMENT*	ESTIMATED DEPTH OF ZONE OF ACTIVE MOVEMENT	COMMENTS ON RESULTS	STRATIGRAPHY AT EXTENSOMETER POSITION
2T920ED(R)	vertically down (3,10,21m) at invert	Behind TBM shield (8m from face)	7.5 mm	Within the immediate surface zone	• only surficial displacement (heaving) was observed • major portion of displacement is time-dependent movement • movement stabilized in 8 days	"Portal" sandstone unit (Figure I-4.2)
2T925EA(R)	vertically upward (see comments)	face installation	(see comments)	N.A.	• Difficulties in installation (see Vol. I) results not reliable • Very minor surficial spalling was observed	"Portal" sandstone unit (Figure I-4.2)
2T925EB(R) 2T925EC(R)	30° upwardly inclined to horizontal	face installation	(see comments)	N.A.	• Difficulties with installation (see Vol. I) results not reliable • No surficial spalling was observed	"Portal" sandstone unit (Figure I-4.2)
2T1420ED(R)	vertically down (3,10,21m)	Behind TBM shield (7m)	34 mm	Between 3 to 10m probably to 5m (at contact of siltstone and sandstone)	• Considerable heaving at invert due to stress relief • Surface spalling was observed at invert • Initially very small relative displacement between anchors at 3 and 10m. More deep seated movement occurred with time	0 - 5 m (III) 5 - 21 m (I) (Figure I-4.4)
2T1428EA(R)	vertically up (3,10,21m)	face installation	68 mm	Primarily within the first 3m	• Considerable downward displacement at back of tunnel. Surficial loosening and spalling was observed within the 60° arch at the back • This is the area where problem with sliding joint occurred, sliding joint closing due to imposed rock load; rock displacement consistent with observed ring beam displacement • Rate of displacement was high during the first day then gradually reduced. Reading stabilized in 10 days.	0 - 1 m (III) 1 - 3.8m (VIA) (McRury seam) 3.8-20m Sandstone(I) with 0.6 m thick Mudstone (IV) layer (Figure I-4.4)
2T1428EB(R) 2T1428EC(R)	30° upwardly inclined to horizontal (3,10,21m)	face installation	(see comments)	N.A.	• Difficulties with installation (see Vol. 1) Results not reliable. 2T1428EB(R) cannot be read • No surficial loosening was observed.	0 - 9.6 m (III) 9.6 - 15.2m (VIA)- McRury Seam 15.2 - 21m (I) (Figure I-4.4)

NOTE: Extensometer Reference No.
(R) for rigid sonice probe and (F) for flexible sonic probe extensometer

*Maximum displacement of surface anchor relative to deepest anchor (the displacements are inward).

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TABLE II-3.1

SUMMARY OF EXTENSOMETER DATA (cont'd)

EXTENSOMETER REF. NO.	ORIENTATION AND DEPTH OF ANCHORS	EXTENSOMETER INSTALLATION RELATIVE TO FACE	MAX. SURFICIAL DISPLACEMENT	ESTIMATED DEPTH OF ZONE OF ACTIVE MOVEMENT	COMMENTS ON RESULTS	STRATIGRAPHY AT EXTENSOMETER POSITION
2T1881ED(R)	vertically downward (3,10,21m)	Behind TBM shield (7m)	25 mm	Within first 3 m	• Rock movement mainly occurred within 3 m. Very small relative movements between anchors at 3 and 10 m • Based on the stratigraphy, heaving was probably confined to the type IV - V rock at the invert • Minor surficial loosening was observed at the invert	0 - 2 m (IV-V) 2 - 4 m (II-IV) 4 - 6 m (V-VI) 6 - 8.4 m (V) (Figure I-4.6)
2T1889EA(F)	vertically upward (0.6,1.2, 1.5,1.8, 2.9,3.8, 4.6 m)	face installation (but initial reading when face was 7 m past due to problem with PVC tubing)	38 mm	Within first 2 m	• Approximately 85% of the displacement occurred within 1.8 m of the surface and 70 percent within the first 1.2 m • No rock movement recorded beyond 2.9 m • Reading stabilized in 21 days • Surficial loosening observed within 60° arch • Spacer blocks were used at the sliding joints to provide rigidity to the ring beam after expansion	0 - 3.4 m (II-III) 3.4 - 5.8m (IV-V) 5.8 - 6.8m (V) 6.8 - 9.6m (IV) (Figure I-4.6)
2T1889EB(F)	30° upwardly inclined (west haunch) (0.5,0.9,1,5, 1.9,2.8,3.7, 4.8,5.7m)	face installation (see comments for 2T1889EA)	4 mm (reading stabilized in 1 day)	Very shallow (probably within first 0.5 m)	• All of the anchors showed very small displacements and there are very minor relative displacements between the anchors • Readings did not indicate any time-dependant movements • No surficial spalling was observed	0 - 14.4 m (II-III) (Figure I-4.6)
2T1889EC(F)	30° upwardly inclined (0.5,0.9, 1,5,1.8,2.6, 4.8,5.2 m)	face installation (see comments for 2T1889EA)			• Only one set of readings were taken due to loss of PVC tube	0 - 14.4 m (II-III) (Figure I-4.6)
2T2263EA(F)	vertically upward (0.5,1.0, 1,4,1.8,3.0, 3.8,4.9,5.8m)	face installation	26 mm reading stabilized in about 6 days	1.4 m	• Approximately 90% of the displacement occurred within 1.4 m of the surface • Minor movement across the contact underlying type III layer was noted • There was no evidence of strata separation at the top of the coal seam nor was there any rock movement above the seam • Surficial loosening was observed within the 60° arch	0 - 2 m (III) 2 - 3.6 m (VI A, Phalen Seam) 3.6-5.5 m (V) 5.5-6.4 m (VI) 6.4-9.4 m (II-III) (Figure I-4.7)
2T2433EA(F)	vertically upward (0.3,0.9, 1.4,1.8,2.8, 3.9,4.7,5.8, 7.2 m)	41 m behind face	22 mm (Stabilized in 13 days)	1.4 m	• Approximately 80% of the displacement occurred within 1.4 m of the surface zone of movement, however extended to about 2.8 m from surface • There was practically no movement beyond about 3 m • All the movements took place within the type V (red mudstone) layer • Surficial loosening was noted across the 60° arch • All measured movements were time-dependant displacements	0 - 4.6 m (V Red Mudstone) 4.6-9 m (III) (Figure I-4.8)

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TABLE II-3.1

SUMMARY OF EXTENSOMETER DATA (cont'd)

EXTENSOMETER REF. NO.	ORIENTATION AND DEPTH OF ANCHORS	EXTENSOMETER INSTALLATION RELATIVE TO FACE	MAX. SURFICIAL DISPLACEMENT	ESTIMATED DEPTH OF ZONE OF ACTIVE MOVEMENT	COMMENTS ON RESULTS	STRATIGRAPHY AT EXTENSOMETER POSITION
2T2749EA(F)	vertically upward (0.4,0.9, 1.4,1.9,2.7, 3.8,4.7,5.7, 7.0)	18 m behind face	10 mm (stabilized in about 6 days)	0.9 - 1.4 m	• Approximately 90% of the displacement occurred within 1.4 m of the surface • No movement beynnd 1.4 m • All movements took place within the type IV layer. No strata separation was noted at the contact of types III & VI • Surficial loosening was noted across the 60° arch • All measured movements were time-dependant displacements	0 - 3 m (III) 3 - 3.2 m (VI) 3.2 - 4 m (IV) 4 - 5.6 m (I) (Figure I-4.9)
2T2996EA(F)	vertically upward (0.4,0.8, 1.3,1.7,3.2, 3.7,4.7,5.6, 6.5 m)	face installation	43 mm	about 2 m	• Approximately 90% of the displacement occurred within the first 1.7 m and 50% within the first 0.8 m • No movement beyond 3.2 m • Relative displacement between the anchor increased during the initial period and became almost constant. This characteristic indicated that the displacement was dominated by the very near-surface movements (surficial loosening) • Surficial loosening was oberved in the 60° arch • All the movements occurred within the type IV layer	0 - 5.2 m (IV) 5.2 - 11.6 m (III) (Figure I-4.10)
2T3205EA(F)	vertically upward	face installation	38 mm (last reading taken prior to loss of access to instrument) Displacements recorded indicated a stabilizing trend	about 2 m	• Approximately 85% of the displacement occurred within the first 1.9 m and 50% within the first 1.0 m • No movement beyond 2.9 m • Surficial loosening was observed in the 60° arch	0 - 1.2 m (III-II) 1.2 - 4.5 m (III) 4.5 - 5.8 m (II) 5.8 - 8.6 m (IV) (Figure I-4.11)
2T3385EA(F)	vertically upward (0.15,0.4, 0.8,1.3,1.8, 2.8,3.7,4.7, 5.6)	8m from face	26 mm (last reading recorded prior to loss of access) Readings indicated a stabilized trend	1.3 - 1.8 m	• Approximately 95% of displacement occurred within the first 1.3-1.8 m, 50% within the first 0.8 m of the surface • No movement beyond 1.8 m • Surficial loosening was observed in the 60° arch	0 - 1.0 m (II-IV) 1.0 - 1.1 m (IV) 1.1 - 4.8 m (IV) thin (VI) layer 4.8 - 8 m (IV) (Figure I-4.12)

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TABLE II-3.1

SUMMARY OF EXTENSOMETER DATA (cont'd)

EXTENSOMETER REF. NO.	ORIENTATION AND DEPTH OF ANCHORS	EXTENSOMETER INSTALLATION RELATIVE TO FACE	MAX. SURFICIAL DISPLACEMENT	ESTIMATED DEPTH OF ZONE OF ACTIVE MOVEMENT	COMMENTS ON RESULTS	STRATIGRAPHY OF EXTENSOMETER POSITION
2T3457EA(F)	vertically upward (0.15,0.4, 0.8,1.3,1.7, 2.8,3.5,4.6, 5.5,6.6)	face installation	58 mm (last reading recorded prior to loss of access) Readings indicated a stabilized trend	1.7 m	• Approximately 90% of displacement occurred within the first 1.7 m, 50% within the first 1.3 m • Small movements across the thin coal seam were noted, but were not indicative of strata separation • No movement beyond 3.5 m • Surficial loosening was observed in the 60° arch	0-0.2 m (VI) 0.2-2.1 m (III) 2.1-2.5 m (VIA Thin coal Seam) 2.5-3.4 m (III) 3.4-7.8 m (VIA Harbour Seam) (Figure I-4.13)
2T3522EA	vertically upward (0.15,0.6, 0.9,1.5,1.8, 2.9,3.8,4.9, 5.3)	62m from face	5 mm (last reading recorded prior to loss of access) Readings have stabilized	1.5 m - 1.8 m	• Approximately 70% of displacement occurred within the first 1.5 m, 50% within the first 0.9 m • No movement beyond 1.8 m • Minor surficial loosening was observed • All measured movements were time-dependent displacements	0 - 1.6 m (II-I) 1.6 - 8 m (I) (Figure I-4.14)
2T3575EA(F)	vertically upward (0.15,0.5, 0.9,1.4, 1.8,2.3)	face installation	-1.5 mm (last reading recorded prior to loss of access)(see also last comment on results)	Negligible	• Tunnel drivage ended at ch. 3579.78 m • The area in the vicinity of the extensometer was supported by pattern bolting • No surficial loosening was observed • Readings reflect the fact that the rock bolts have caused an upward displacement at the surface	0 - 2.3 m (III) (Figure I-4.15)

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TABLE II-4.1

SPECIAL FEATURES OF SUPPORT SYSTEM

AT THE INSTRUMENTED ARRAYS

CHAINAGE	SPECIAL FEATURES OF SUPPORT SYSTEM
984 m (ARRAY T2-1)	• Sliding joints at end of crown segment to allow an expansion of up to 210 mm per joint. The sliding joint was locked in place after expansion of the ring by means of a friction plate bolted to the sliding joint and a steel wedge was placed through the slot in the sliding joint. • Cross beam and posts supporting conveyor and rail tracks are connected to ring beam. • Ring beam at ch. 1020 m was pinned to prevent ring beam rotation during thrusting. This has affected the thrust load transmitted to ch. 984 m.
1423 m (ARRAY T2-2)	• Sliding joint at end of the crown segment used with no steel wedge. The joint was allowed to slide when the crown segment took on load.
1831 m (ARRAY T2-3)	• Sliding joint at end of the crown segment used in conjunction with 150 mm long spacers to limit closure of sliding joint to 50 mm (maximum).
3353 m (ARRAY T2-4)	• Spacer block used at crown segment with timber wedges. Sliding joint was closed prior to ring beam assembly.

NOTE: All ring beams are of W150 x 23 sections spaced at 1.5 m centres at the instrumented arrays.

TABLE II-4.2

SUMMARY OF INPUT PARAMETERS
AND LOADING PATTERNS FOR
ROCK-SUPPORT INTERACTION ANALYSIS

Rock Properties

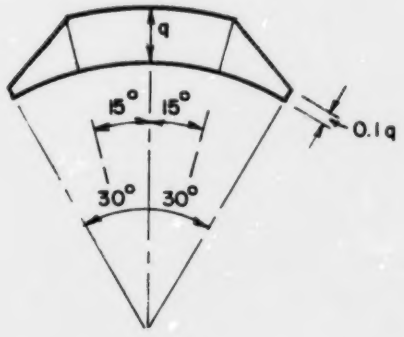
Range of Deformation Modulus	E_r = 5400 - 22400 MPa
Poisson's Ratio	ν_r = 0.25

Ring Beam Properties

Cross Section Area,	A_s = 2980 mm^2
Moment of Inertia,	I_{xx} = 12.6 x 16^6 mm^4
Deformation Modulus,	E_s = 207 GPa

Loading Pattern on Crown Segment q = Applied crown surcharge

(A)



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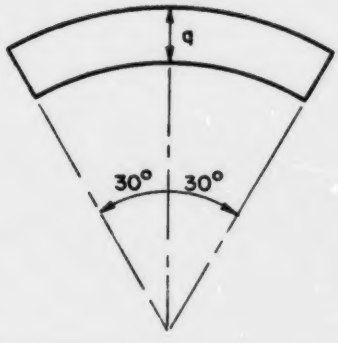

TABLE II-4.3

SUMMARY OF MEASURED AXIAL STRESSES IN
RING BEAM AND ESTIMATED DEPTH OF LOOSENING AT CROWN

CHAINAGE (m)	INSTRUMENT NO.	STEEL SET INSTALLATION		STABILIZED READING		NET MEASURED (MPa)	CORRECTED* MEASURED (MPa)	ESTIMATE OF DEPTH OF LOOSENING AT CROWN (REF. EXTENSOMETER)
		DATE; TIME	READING (MPa)	DATE; TIME	READING (MPa)			
984	SC7 SC8	9.04.84;19:48 9.04.84;19:48	0.05 3.12	30.07.84;10:00 30.07.84;10:00	0.15 4.05	0.10 0.93	0.82 7.58 Av=4.20	0.1-0.2 m (Refer to visual observation)
1423	SC7 SC8	28.05.84;19:40 28.05.84:19:40	1.45 3.27	30.05.84:21:39 28.11.84:10:00	11.16** 10.60	9.71 7.33	79.14 59.74 AV=69.5	2-2.5 m (2T1428EA)
1831	+SC7 SC8	- 1.08.84:17:44	- 0.52	- 20.02.85;12:00	- 8.16	- 7.64	- 62.27	1.8-2.0 m (2T1889EA)
3353	SC7 SC8	2.12.84:18:48 2.12.84;18:48	5.13 3.07	20.02.85:12:00 10.12.84; 9:50	14.85 15.92 **	9.72 12.84	79.32 104.55 AV=92	2.0-2.5 m (2T3205EA) (2T3385EA)

NOTES: * Cell areal correction factor = 8.15 +ve compression
** Last reading before gauge reading went off scale
+ Ring beam too tight, SC7 taken out during assembly

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TABLE II-4.4

COMPARISON OF MEASURED AND COMPUTED
RADIAL ROCK STRESSES AT CHAINAGE 984 m

DATE OF STEEL SET INSTALLATION: April 9, 1984, 19:48 [A]
DATE OF READING : November 28, 1984,10:00 [B]
May 4, 1984,10:00 [C]

INSTRUMENT NO.	MEASURED STRESSES (kPa)					COMPUTED STRESSES FOR CROWN SURCHARGE**,q=6 kPa
	A	B	C	Net*		
				B-A	C-A	
SC1	0	0	0	0	0	0
SC2	100	70	30	-30	-70	29
SC3	20	460	250	440	230	26
SC4	80	120	90	40	10	26
SC5	-	-		-		26
SC6	50	210	70	160	20	29

* +ve compression
** Load Pattern A

NOTES:
1. Crown surcharge interpreted from measured average axial ring stress of 4.20 MPa (Table II-4.3)based on Load Pattern A.
2. Elastic modulus of rock=22000 MPa in analytical solution.
3. Initial stabilization of reading occurred when face was at 1254 m. Data shown in column C.
4. The remedial stresses occur at the contact of ring beam and rock.

TABLE II-4.5

COMPARISON OF MEASURED AND COMPUTED

RADIAL ROCK STRESSES AT CHAINAGE 1423 m

DATE OF STEEL SET INSTALLATION: May 28, 1984; 19:40 [A]
DATE OF FINAL READING : Sept. 23,1984;14:00 [B]

INSTRUMENT NO.	MEASURED STRESS (kPa)			COMPUTED STRESSES FOR CROWN SURCHARGE**,q=79 kPa
	A	B	Net*(B-A)	
SC1	-50	-10	+40	0
SC2	40	440	400	380
SC3	-30	350	380	330
SC4	250	530	280	330
* SC5	0	580	580	330
SC6	100	270	170	380

*SC5 suffered considerable variations during the course of monitoring

* +ve compression
** Load Pattern A

NOTES:
1. Crown surcharge interpreted from measured average axial ring stress 69.5 MPa (see Table II-4.3) based on Load Pattern A.
2. Elastic modulus of rock = 7100 MPa in analytical solution.
3. The radial stresses occur at the contact of ring beam and rock.

TABLE II-4.6

COMPARISON OF MEASURED AND COMPUTED
RADIAL ROCK STRESSES AT CHAINAGE 1831 m

DATE OF STEEL SET INSTALLATION: August 1, 1984; 17:44 [A]
DATE OF FINAL READING : February 2, 1985: 12:00 [B]

INSTRUMENT NO.	MEASURED STRESSES (kPa)			COMPUTED STRESSES FOR CROWN SURCHARGE**, q=73 kPa
	A	B	Net*(B-A)	
SC1	-20	90	110	0
SC2	50	290	240	350
SC3	220+	520++	300	305
SC4	40	510++	470	305
SC5	-30	200	230	305
SC6	60	340	280	350

+ Initial Reading taken on August 1, 1984,21:20
++ Average Stabilized Reading

* +ve compression
** Load Pattern A

NOTES: 1. Crown Surcharge interpreted from measured average axial ring stress 62 MPa (see Table II-4.3) based on Load Pattern A.

2. Elastic Modulus of rock = 5400 MPa in analytical solution.

3. The radial stresses occur at the contact of ring beam and rock.

TABLE II-4.7

COMPARISON OF MEASURED AND COMPUTED

RADIAL ROCK STRESSES AT CHAINAGE 3353 m

DATE OF STEEL SET INSTALLATION: December 2, 1984;18:48 [A]
DATE OF FINAL READING : February 20, 1985;12:00 [B]

INSTRUMENT NO.	MEASURED STRESSES (kPa)			COMPUTED STRESSES FOR CROWN SURCHARGE**,q=104 kPa
	A	B	Net*(B-A)	
SC1	0	470	470	0
SC2	20	210	190	496
SC3	-20	230	250	440
SC4	50	870+	820	440
SC5	-60	170	230.	440
SC6	0	360	360	496

+Stabilized reading taken on December 5, 1984;7:30; reading dropped abruptly to zero after this date, probably reading went off scale.

* +ve compression
** Load Pattern A

NOTES:: 1. Crown Surcharge interpreted from measured average axial ring stress 92 MPa (see Table II-4.3) based on Load Pattern A.

2. Elastic Modulus of rock = 8100 MPa in analytical solution.

3. The radial stresses occur at the contact of ring beam and rock.

TABLE II-4.8

COMPARISON OF MEASURED AND
COMPUTED STRAINS IN RING BEAM
AT CHAINAGE 984 m

DATE OF STEEL SET INSTALLATION: April 9, 1984;19:48 [A]
DATE OF STABILIZED READING : February 2, 1985;12:00 [B]

INSTRUMENT NO.	MEASURED STRAINS (με)			COMPUTED STRAINS (με) FOR CROWN SURCHAGE**,q=6 kPa
	A	B	Net*(A-B)	
•SS1A	1814	1877++	-63	49
•SS1B	2108*	2054++	49	27
SS1C	1997*	1941	56	49
•SS1D	1657	1790	-133	27
SS2A	2113	2185	-72	25
SS2B	2638	2737	-99	51
SS2C	1765	1688	77	39
SS2D	2247	2419	-172	37
SS3A	2029	2061	-32	38
SS3B	1861	1872	-11	38
SS3C	-	-	-	38
SS3D	-	-	-	38
•SS4A	2349	2029	320	38
•SS4B	2400	2143	257	38
•SS4C	8260**	1966	294	38
•SS4D	2214	2137	77	38
•SS5A	2314	2621	-307	38
•SS5B	-	-	-	38
SS5C	-	-	-	38
SS5D	-	-	-	38
SS6A	2130	2222+	-92	39
•SS6B	2290	2421+	-131	37
SS6C	2142	2122	20	25
SS6D	2852	2900	-48	51

• Fluctuation of strain readings occurred
* Initial readings taken on April 9, 1984;21:30
** Initial readings taken on April 9, 1984;23:03
*** Initial readings taken on April 17, 1984;18:00
\+ Final reading taken on September 21,1984;14:00
++ Final reading taken on April 26, 1984;10:00

* +ve compression
** Load Pattern A

] due to very tight cabling schedule

TABLE II-4.9

COMPARISON OF MEASURED AND
COMPUTED STRAINS IN RING BEAM
AT CHAINAGE 1423 m

DATE OF STEEL SET INSTALLATION: May 28, 1984;19:33 [A]
DATE OF STABILIZED READING : February 2, 1985;12:00 [B]

INSTRUMENT NO.	MEASURED STRAINS (με)			COMPUTED STRAINS (με) FOR CROWN SURCHARGE**,q=79 kPa
	A	B	Net*(A-B)	
•SS1A	1677	1510	167	435
•SS1B	1937	2418+	-481	265
•SS1C	1984	1900+	84	435
•SS1D	1643	1418	225	265
SS2A	-	-	-	255
SS2B	-	-	-	445
•SS2C	1730	1513	217	355
•SS2D	1803	1684	119	345
SS3A	1756	1634	122	350
SS3B	2029	1836	193	350
•SS3C	2242	2301	-59	350
•SS3D	2562	2263	299	350
•SS4A	2024	971	1053	350
SS4B	1910	-	-	350
SS4C	1834	-	-	350
•SS4D	2483	2164	319	350
SS5A	1885	1297	588	350
SS5B	-	-	-	350
SS5C	1946	1800+	146	350
•SS5D	2231	1739+	492	350
SS6A	-	-	-	355
SS6B	-	-	-	345
SS6C	-	-	-	255
SS6D	-	-	-	445

+ Final reading taken on November 28, 1984;10:00
• Fluctuations in the strain readings occurred
*+ve compression
**Load Pattern A

TABLE II-4.10

COMPARISON OF MEASURED AND COMPUTED STRAINS IN RING BEAM AT CHAINAGE 1831 m

DATE OF STEEL SET INSTALLATION: August 1, 1984;17:52 [A]
DATE OF STABILIZED READING : February 20, 1985;12:00 [B]

INSTRUMENT NO.	MEASURED STRAINS (με)			COMPUTED STRAINS (με) FOR CROWN SURCHARGE**,q=73 kPa
	A	B	Net*(A-B)	
SS1A	1883	1885	-2	400
SS1B	2209	1939	270	220
SS1C	1995	1592	403	400
•SS1D	2126	1807	319	220
SS2A	-	-	-	210
SS2B	-	-	-	410
SS2C	1800	1442	358	315
SS2D	1836	1453	383	305
SS3A	1908	1732	176	310
SS3B	2036	1787	249	310
SS3C	-	-	-	310
SS3D	-	-	-	310
•SS4A	2286	1545	741	310
•SS4B	2088	955	1133	310
SS4C	-	-	-	310
SS4D	2871+	2368	503	310
SS5A	1881+	1770	117	310
SS5B	2075++	1541	534	310
SS5C	2171++	1443	728	310
SS5D	1874	1850	24	310
SS6A	2079	2011	68	315
SS6B	1842	1315	527	305
SS6C	-	-	-	210
SS6D	-	-	-	410

\+ Initial reading taken on August 1, 1984;18:52
++ Initial reading taken on August 1, 1984;20:50
+++ Stabilized reading taken on September 17,1984;14:00
• Fluctuation of strain readings occurred

* +ve compression
** Load Pattern A

TABLE II-4.11

COMPARISON OF MEASURED AND
COMPUTED STRAINS IN RING BEAM
AT CHAINAGE 3353 m

DATE OF STEEL SET INSTALLATION: December 2, 1984;18:50 [A]
DATE OF STABILIZED READING : December 17, 1964;19:00 [B]

INSTRUMENT NO.	MEASURED STRAINS (με)			COMPUTED STRAINS (με) FOR CROWN SURCHARGE**,q=104 kPa
	A	B	Net*(A-B)	
SS1A	1952	481	1471	600
SS1B	1596	812	784	310
SS1C	1111	-	-	600
*SS1D	2001	1995	6	310
•SS2A	1945	1762	183	315
SS2B	2165	1193	972	595
SS2C	1867	1313	554	465
SS2D	2139	1526	613	445
•SS3A	1825	1224	601	455
•SS3B	2193	1140	1053	455
SS3C	1866	1489	377	455
•SS3D	3668	2871	797	455
SS4A	1958	1390	568	455
*SS4B	1904	413	1491	455
SS4C	1563	-	-	455
SS4D	2403	1835	568	455
SS5A	1791	-	-	455
SS5B	4466	3774	692	455
•SS5C	2095	1117	978	455
•SS5D	1937	1288	649	455
SS6A	2061	1636	426	465
SS6B	1749	683	1066	445
SS6C	2394	1901	493	315
SS6D	4311	3431	880	595

* Results not reliable
• Fluctuation of strain readings occurred

* +ve compression
** Load Pattern A

TABLE II-5.1

SUMMARY OF MAXIMUM AND RESIDUAL LOADS IN THRUST BLOCKS

CHAINAGE (m)	THRUST BLOCK NO.	MAXIMUM THRUST LOAD (CHAINAGE) (kN)	CHAINAGE OF FACE WHERE THRUST LOAD STABILIZED (m)	RESIDUAL THRUST LOAD (kN)
984 m	1	91 (991) (1)	ch. 1030	0
	4	280 (993)		-15
	5	51 (989)		- 6
	8	412 (993)		16
	9	442 (993)		7
	12	320 (992)		37
	13	360 (1005)		25
	14	392 (995)		45
	15	332 (996)		62
	16	406 (992)		42
	17	484 (991)		89
	18	607 (991)		87
	19	537 (991)		61* 1 gauge only
	20	432 (991)		95
	21	479 (996)		75
	22	591 (991)		78
	23	446 (992)		131
	24	354 (992)	(only one gauge was working)	-74
1423 m	1	440 (1434)	ch. 1461	133
	4	391 (1430)		114
	5	407 (1434)		168
	8	604 (1429)		112
	9	482 (1429)		265
	12	628 (1429)		197
	13	733 (1429)		286
	16	594 (1429)		166* 1 gauge only
	17	671 (1429)		343
	20	598 (1428)		336
	21	634 (1429)		385
	24	(No Readings)		-
1831 m	2	259 (1842)	ch. 1889	157
	6	(not sufficient data)		89
	7	225 (1841)		66
	12	88 (1848) - 1 gauge only		121
	13	408 (1841)		107
	18	201 (1841)		168
	19	698 (1841)		365
	24	517 (1841)		245

NOTE: (1) 91 (991) maximum load of 91 kN in thrust block No. 1 occurred when face was at ch. 991 m.

TABLE II-6.1

SUMMARY OF DISTANCE FROM FACE WHEN CONVERGENCE ARRAYS AND ROCK SUPPORT WERE INSTALLED IN TUNNEL NO. 3

CHAINAGE (m)	FACE CHAINAGE (DIST. FROM FACE) (m) CONVERGENCE ARRAY INSTALLED	ROCK BOLTS INSTALLED	SHOTCRETE INSTALLED
152	154.0 (2.0)	155.0 (3.0)	172.8 (20.8)
164	166.0 (2.0)	167.0 (3.0)	172.8 (8.8)
200	201.5 (1.5)	203.0 (3.0)	212.1 (12.1)
318	321.0 (3.0)	321.0 (3.0)	342.0 (24.1)
460	462.5 (2.5)	463.0 (3.0)	462.5 (2.5)
798	800.0 (2.0)	801.0 (3.0)	815.0 (17.0)
918	919.2 (1.2)	921.0 (3.0)	918.0 (0)

TABLE II-6.2: SUMMARY OF INSTALLED ROCK SUPPORT AND EXCAVATION TOLERANCES AT CONVERGENCE STATIONS IN TUNNEL NO. 3

CHAINAGE (m)	INSTALLED SHOTCRETE THICKNESS[1] ACROSS CROWN OF TUNNEL (mm) (SPECIFIED THICKNESS) A	B	C	D	E		OBSERVED CONDITION[2] OF SHOTCRETE	NO. OF ROCK BOLTS NO. (length)	MEASURED AVERAGE OVERBREAK[3] IN EXCAVATED PROFILE (m) WS	WH	CR	EH	ES
152	30	25	50	60	30	(50)	Sound	6 (2.5 m) @ 1.2m c/c	0.39	0.43	0.40	0.41	0.41
164	50	50	50	25	15	(50)	Sound	6 (2.5 m) @ 1.2m c/c	0.39	0.40	0.40	0.42	0.42
200	100	50	80	50	50	(75)	Sound	5 (3.5 m) @ 1.5m c/c	0.38	0.38	0.46	0.41	0.38
318	(thickness not probed)					(50)	Sound (wet area in crown)	5 (3.5 m) @ 1.5m c/c	not available				
460	Area with mesh reinforced shotcrete					(50)	Sound	5 (3.5 m) @ 1.5m c/c	0.38	0.36	0.40	0.37	0.38
798	(thickness not probed)					(50)	drummy area in crown	5 (3.5 m) @ 1.5m c/c	0.40	0.37	0.40	0.40	0.41
918	Area with mesh reinforced shotcrete					(50)	Sound		0.40	0.38	0.37	0.38	0.39

NOTES:

(1) Thickness of shotcrete was checked by drilling probe holes at the crown at the following points:- (specified thickness in brackets)

Point	Offset Distance from Crown Line of Tunnel
A	3.0 m west
B	1.5 m west
C	o (crown line)
D	1.5 m east
E	3.0 m east

(2) Shotcrete was inspected by sounding with hammer and visual observation

(3) Overbreak in the excavated profile was measured at the following points:

WS - west springline
WH - west haunch (45°)
CR - crown
EH - east haunch (45°)
ES - east springline

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TABLE II-6.3

SUMMARY OF CONVERGENCE DATA AT CH. 918 m IN TUNNEL NO. 3

	CONVERGENCE (mm)																
TIME (days)	0	13	14	15	16	23	28	30	51	52	57	73	127	186	243	340	396
FACE DISTANCE (m)	1.2	1.5	4.5	11	14	28	30	30	102	109	109	109	109	109	109	109	109
LINE 1-3	0	0.93	6.1	2.6	-	3.8	-	4.9	-	4.88	-	-	-	-	-	-	-
1-4	0	2.45	0.9	3.2	-	-	-	-	-	-	-	6.5	7.4	8.5	-	9.37	9.13
1-5	0	2.8	5.7	8.2	10	12.6	12.8	13.6	-	-	13.9	13.5	14.0	13.9	15.7	15.6	15.9
2-4	0	2.9	6.0	7.2	-	-	-	-	-	-	-	-	-	-	-	-	-
2-5	0	2.9	6.0	6.2	-	-	-	10.8	-	-	-	10.2	10.7	12.2	-	12.8	13.1
3-5	0	2.0	2.3	1.2	-	4.4	-	4.0	-	3.2	-	-	-	-	-	-	-

NOTE: 1. Face was at ch. 919.2 m when convergence array was installed.

2. Line 1-3 represents line of convergence measurements between points 1 and 3.

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TABLE II-7.1: COMPARISON OF PERFORMANCE OF DRILL-AND-BLAST AND TBM DRIVAGES IN PORTAL SANDSTONE

ASPECT	DRILL-AND-BLAST DRIVAGE (TUNNEL NO. 3)	TUNNEL BORING MACHINE (TBM) DRIVAGE (TUNNEL NO. 2)
1. Length And Dimensions of Tunnel	• Length = from Portal to ch. 1027 m (in sandstone) • Dimensions = 7.6 m wide x 5.3 m high with uniradial arch • Gradient = -20% (790 m), curve (80 m) -10% (197 m)	• Length = from Portal to ch. 3580 m (Sandstone 0-1300 m) (Mixed Sediments 1300-3580 m) • Dimensions = 7.6 m Diameter • Gradient = -20% (790 m), curve (80 m), -10% (100m), curve (100 m), -1.075% (2510 m)
2. Excavation Technique	• Full face drill-and-blast method using both permissible and non-permissible explosives and non-permissible milli-second delay blasting caps	• Full face shielded LOVAT TBM advanced by jacking against series of ring beams and thrust blocks installed behind the shield
3. Installed Rock Support	• 25 mm dia. x 3.5 m long rockbolts at 1.5 m centres, generally 5 bolts across crown arch. 50 mm (minimum thickness) shotcrete applied above springline, reinforced with 150 mm x 150 mm x 4 mm mesh if required • Rock Support installation completed close to face prior to further advance of tunnel	• W150 x 23 (kg/m) ring beams at 1.5 m centres • 1.7 m long x 0.8 m wide mesh panels fabricated from 8 mm (longitudinal) and 4 mm (cross) wires installed between ring beams covering approximately 120° arch above springline • steel channel lagging placed between ring beams to support mesh if required. (see Figure I-5.3 for installed support) • Ring beams at 1 m centres in the vicinity of major coal seams.
4. Observed Stability Condition	• Tunnel stable • Isolated minor cracking and drummy areas at locations where the shotcrete was less than 25 mm in thickness • Spalling on sidewalls where shotcrete was not applied	• Tunnel stable • Minor surficial spalling at crown over 20°-30° arch; generally supported with mesh panels

cont'd.....

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TABLE II-7.1: COMPARISON OF PERFORMANCE OF DRILL-AND-BLAST AND TBM DRIVAGES IN PORTAL SANDSTONE (cont'd)

ASPECT	DRILL-AND-BLAST DRIVAGE (TUNNEL NO. 3)	TUNNEL BORING MACHINE (TBM) DRIVAGE (TUNNEL NO. 2)
5. Measured Rock Displacement	• Maximum surface convergence measured across springline at ch. 918 m = 16 mm (cumulative displacement of both sidewalls) • Inferred maximum vertical displacement at crown = 2.8 mm • Convergence points installed at 1.2 m from face	• Maximum displacement measured at extensometer (horizontal MPBX) anchor position located at 1.5 m from the east side wall of Tunnel No. 2 = 6.32 mm • Horizontal MPBX pre-installed from tunnels No. 3 to 2
6. Excavation Tolerances and Disturbance	• Average overbreak varied between 0.38 and 0.46 m with the overbreak at the crown being marginally higher • Finished profile generally rugged • Blast induced fractures noted in bore-hole (ch. 804) drilled across tunnel o Spalling from sidewall along blast induced fractures over areas not shotcreted	• With the exception of minor spalling at crown over the 20-30° arch, no overbreak was discernible • No spalling from tunnel surface due to excavation disturbance • Smooth finished profile
7. Influence on Rock Mass Properties	• Average insitu dynamic modulus = 12 to 30 GPa (based on hammer seismic survey at ch. 400 to 800 m) • Average insitu modulus over 3 m from tunnel wall = 10 GPa (based on dilatometer tests)	• Average insitu dynamic modulus = 23 to 34 GPa (based on hammer seismic survey at ch. 400 to 800 m) • Average insitu modulus over 3m from tunnel wall = 22 GPa (based on dilatometer tests)

cont'd....

TABLE II-7.1: COMPARISON OF PERFORMANCE OF DRILL-AND-BLAST AND TBM DRIVAGES IN PORTAL SANDSTONE (cont'd)

ASPECT	DRILL-AND-BLAST DRIVAGE (TUNNEL NO. 3)	TUNNEL BORING MACHINE (TBM) DRIVAGE (TUNNEL NO. 2)
8. Drivage Progress Rate	• Time to complete drivage from ch. 220 to 1027 m April 19, 1982 - Feb. 12, 1983 Typical cycle time to advance 3 m (3 m round) = 12 - 13 hours	• Time to complete drivage from ch. 220* to 1027 m January 3, 1984 - April 11, 1984 Typical cycle time to advance 3 m (2 pushes) = 3 hours * When trailing package of TBM fully installed

Form G.A.-D-4 (M)

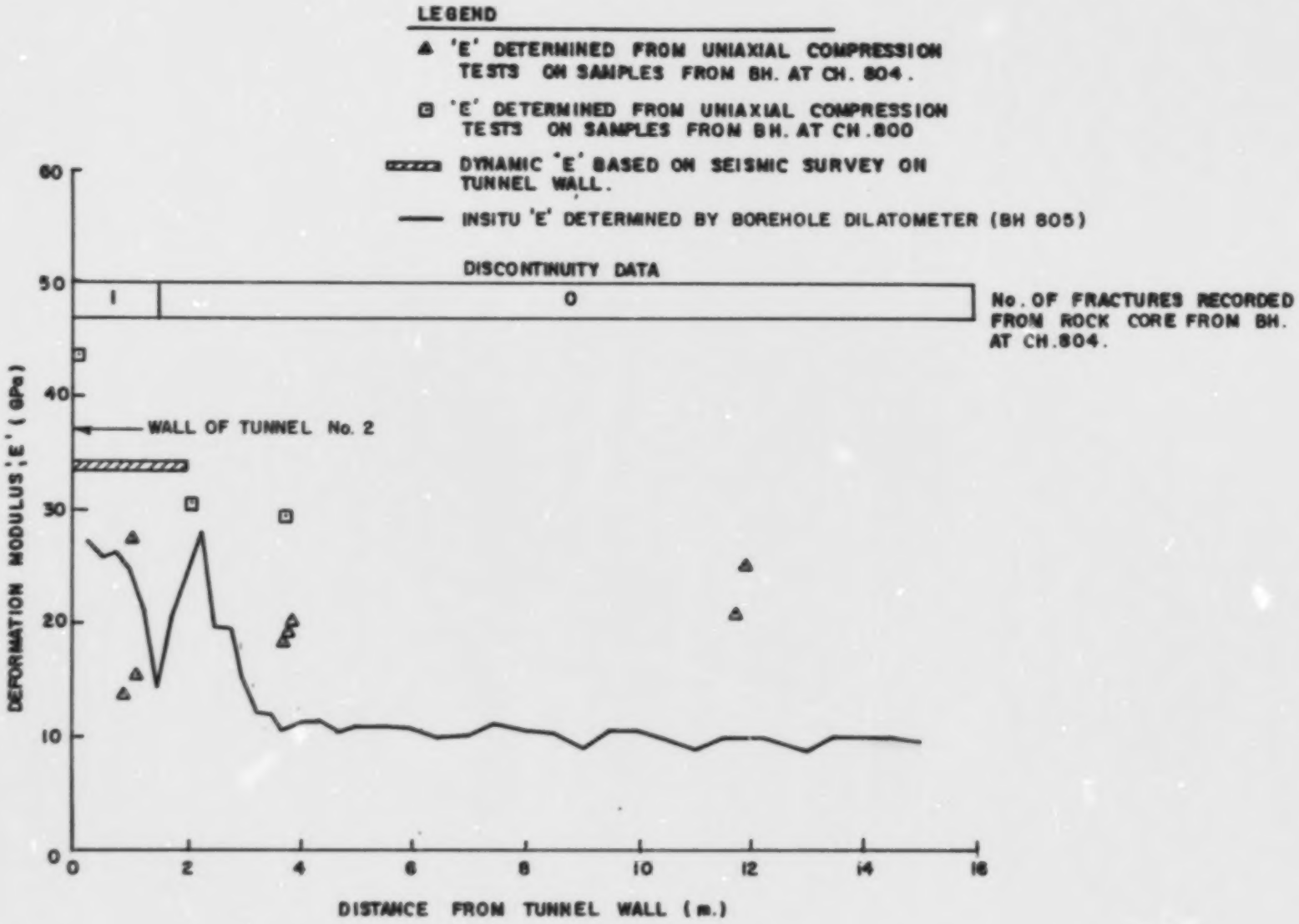
Date MAY 10, 1985
Project 831-6014

Golder Associates

Drawn R.M.
Chkd.

VARIATION OF DEFORMATION MODULUS WITH DEPTH TUNNEL No. 2

FIGURE II-2.1



VARIATION OF DEFORMATION MODULUS WITH DEPTH
TUNNEL No.3

FIGURE II-2.2

LEGEND
E DETERMINED FROM UNIAXIAL COMPRESSION TESTS ON SAMPLES FROM BH. AT CH. 804.
E DETERMINED FROM UNIAXIAL COMPRESSION TESTS ON SAMPLES FROM BH. AT CH. 800
DYNAMIC E BASED ON SEISMIC SURVEY ON TUNNEL WALL.
BH 805 } INSITU 'E' DETERMINED BY BOREHOLE
BH 803 } DILATOMETER
No. OF FRACTURES RECORDED FROM CORE BH. 804
DISCONTINUITY DATA
WALL OF TUNNEL No. 3
DEFORMATION MODULUS 'E' (GPa)
DISTANCE FROM TUNNEL WALL (m)

Date MAY 9, 1985

Project 831-6014

Golder Associates

Drawn D.M.

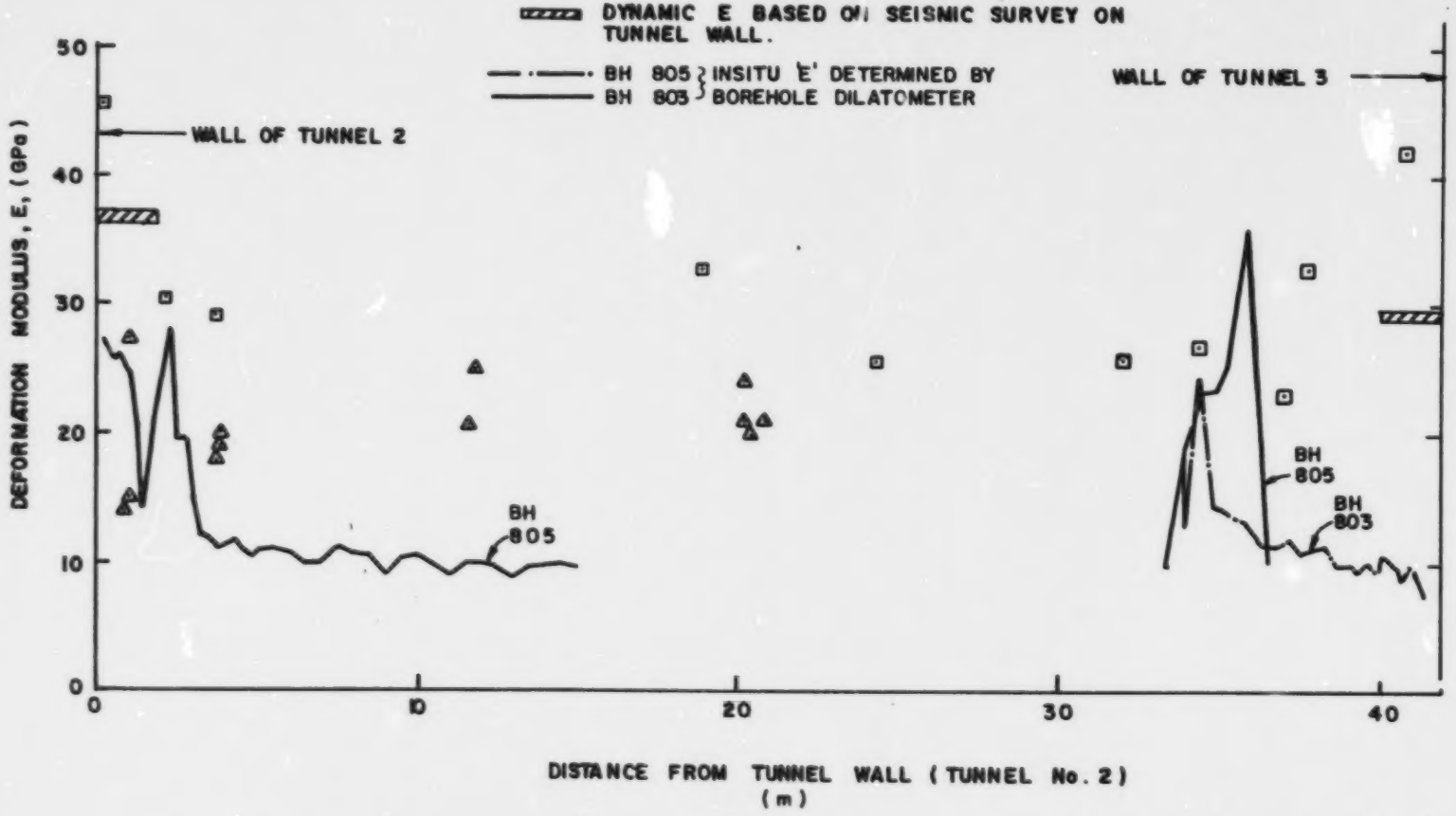
Chkd.

Form G.A.-D.-4 (M)

Date MAY 9, 1985
Project 831-6014

Golder Associates

Drawn D.M.
Chkd.

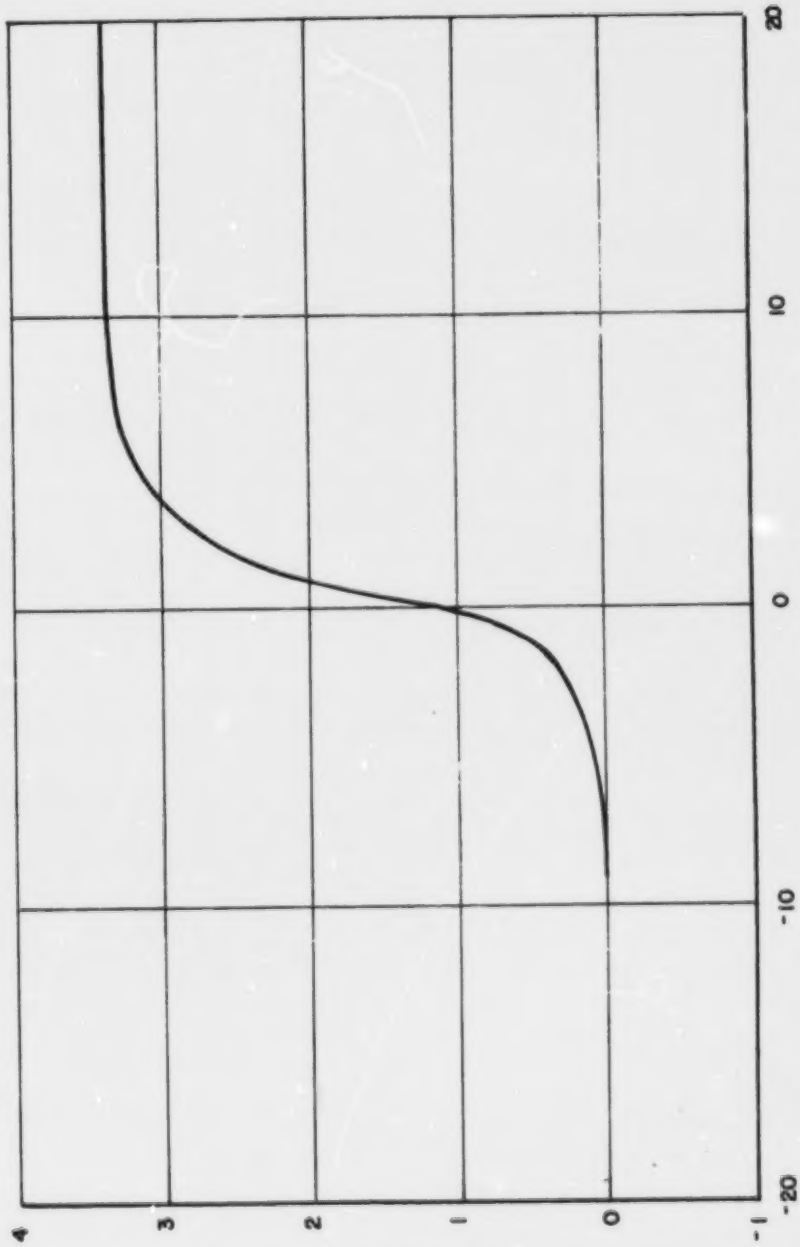


VARIATION OF DEFORMATION MODULUS BETWEEN TUNNELS 2 AND 3

FIGURE II-2.3

THEORETICAL DISPLACEMENT AT SPRINGLINE DURING TUNNEL ADVANCE

FIGURE II-3.1



NOTES:
1) BASED ON SOLUTION BY NWA ET AL (1979)
2) Ko = 2.5, Pv = 4.9 MPa, E = 22.4 GPa

Date MAY 17, 1985
Project 831-6014

Golder Associates

Drawn G.S.
Chkd. CV

Form G.A.-D.-4 (M)

DISTRIBUTION OF MEASURED AND COMPUTED ELASTIC DISPLACEMENTS WITH DEPTH ; CHAINAGE 800m

FIGURE II-3.2

Date MAY 17, 1985

Project 831-6014

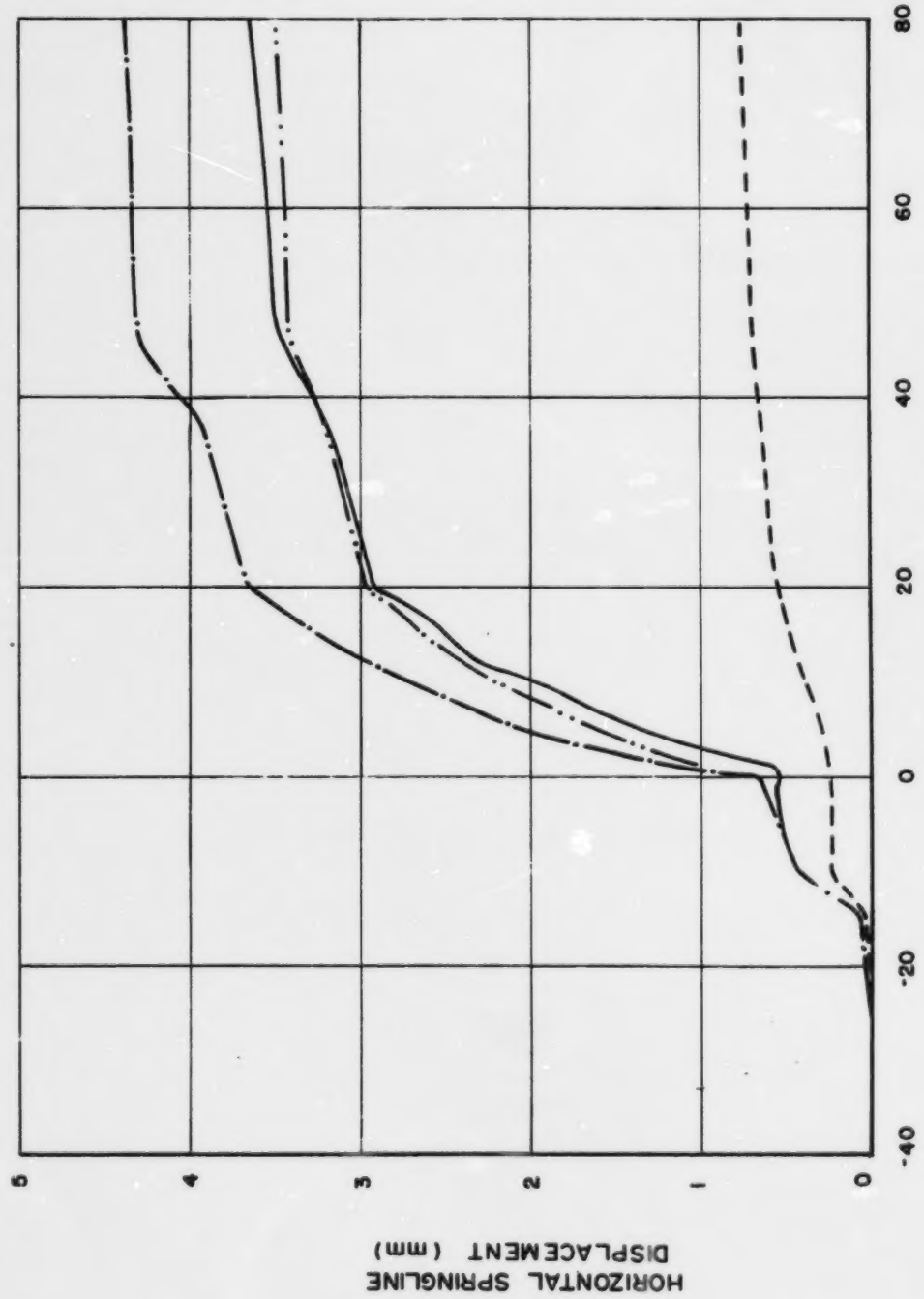
Golder Associates

Drawn G.P.

Chkd.

MEASURED DISPLACEMENT AT SPRINGLINE DURING TUNNEL ADVANCE; CHAINAGE 800m

FIGURE II-3.3



Date MAY 16, 1985

Project 831-6014

Golder Associates

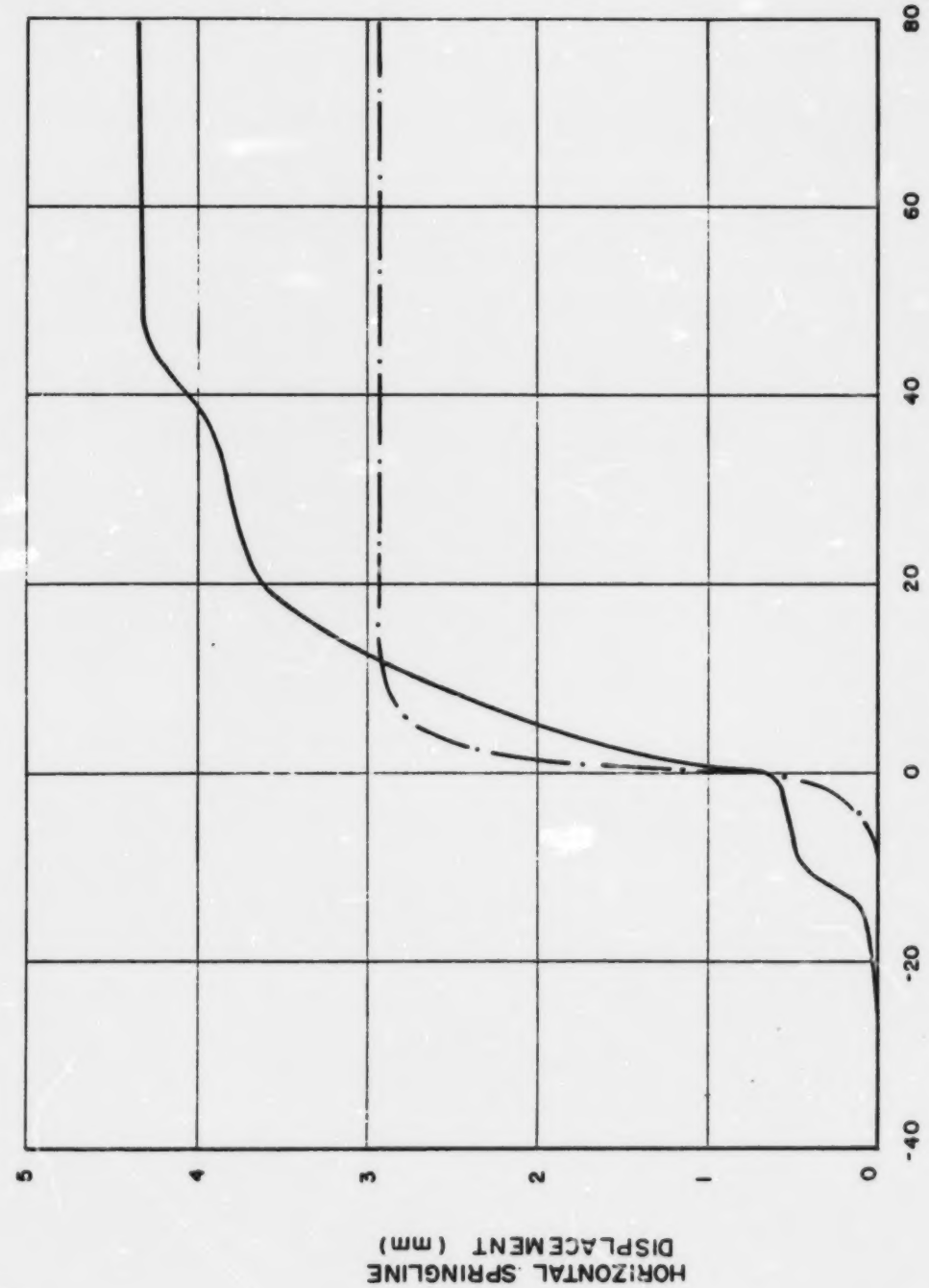
Drawn G.P.

Chkd.

Form G.A.-D.-4 (M)

MEASURED AND THEORETICAL DISPLACEMENTS AT 1.5m DURING TUNNEL ADVANCE; CHAINAGE 800m

FIGURE II-3.4



Date MAY 16, 1985

Project 831-6014

Golder Associates

Drawn G.P

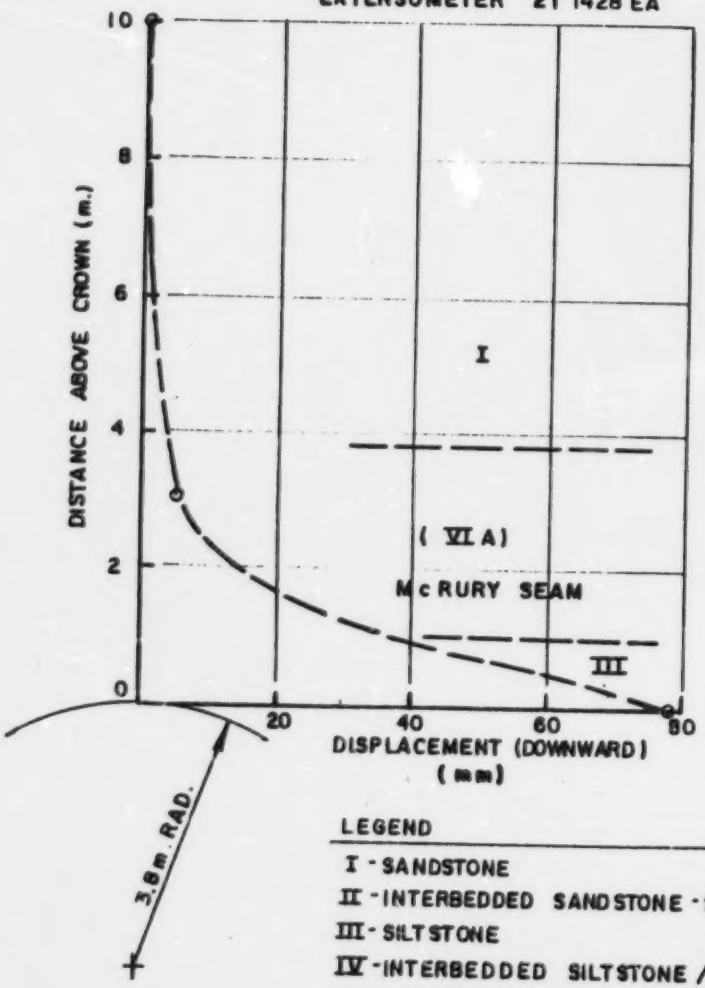
Chkd.

Date MAY 6, 1985
Project 831-6014

Golder Associates

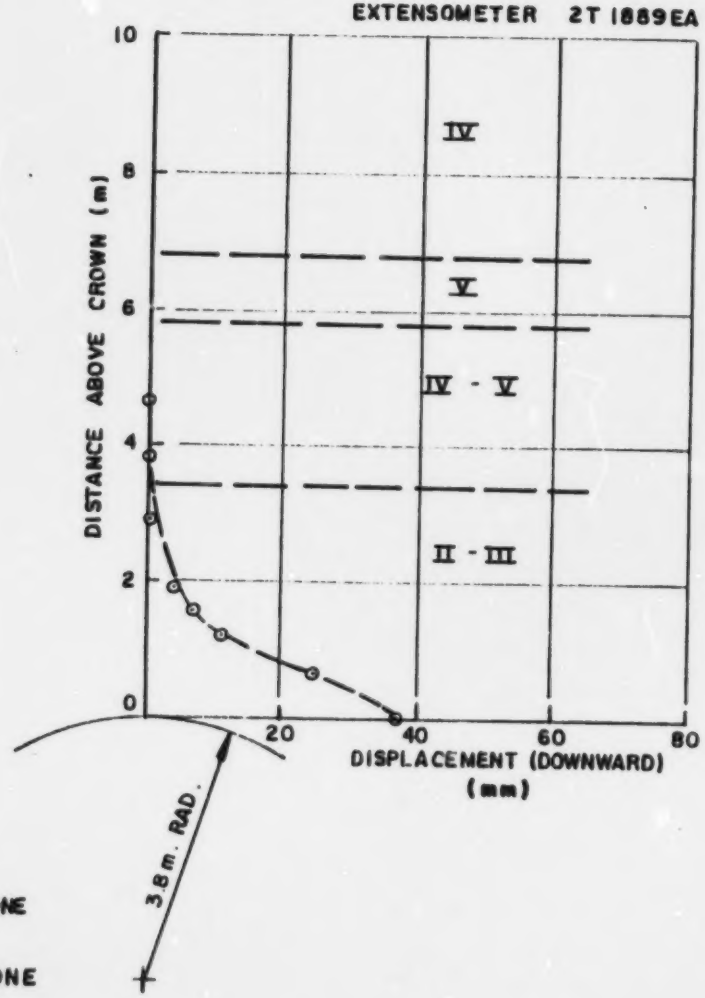
NOTE : EXTENSOMETER INSTALLED AT FACE

EXTENSOMETER 2T 1428 EA



NOTE : EXTENSOMETER INSTALLED AT FACE

EXTENSOMETER 2T 1889EA



LEGEND

I - SANDSTONE
II - INTERBEDDED SANDSTONE - SILTSTONE
III - SILTSTONE
IV - INTERBEDDED SILTSTONE / MUDSTONE
V - MUDSTONE
VI - CARBONACEOUS MUDSTONE
VI A - COAL

Drawn D.M.
Chkd.

DISTRIBUTION OF DISPLACEMENT WITH DEPTH ABOVE TUNNEL CROWN (CH. 1428 m. / CH. 1889 m.)

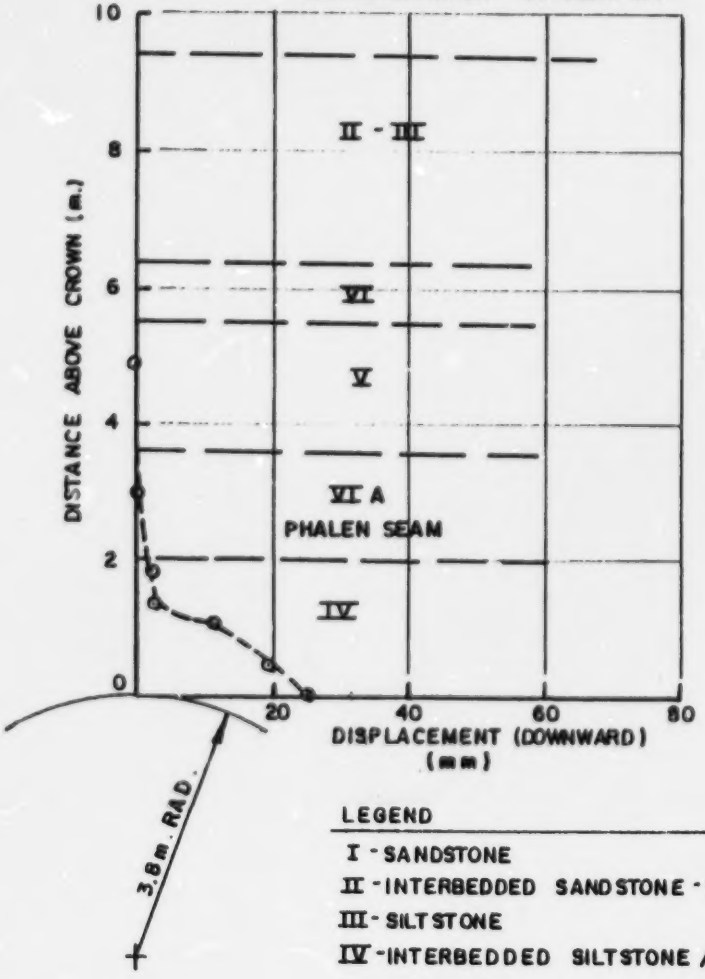
FIGURE II-3.5

Date MAY 6,1985
Project 831-604

Golder Associates

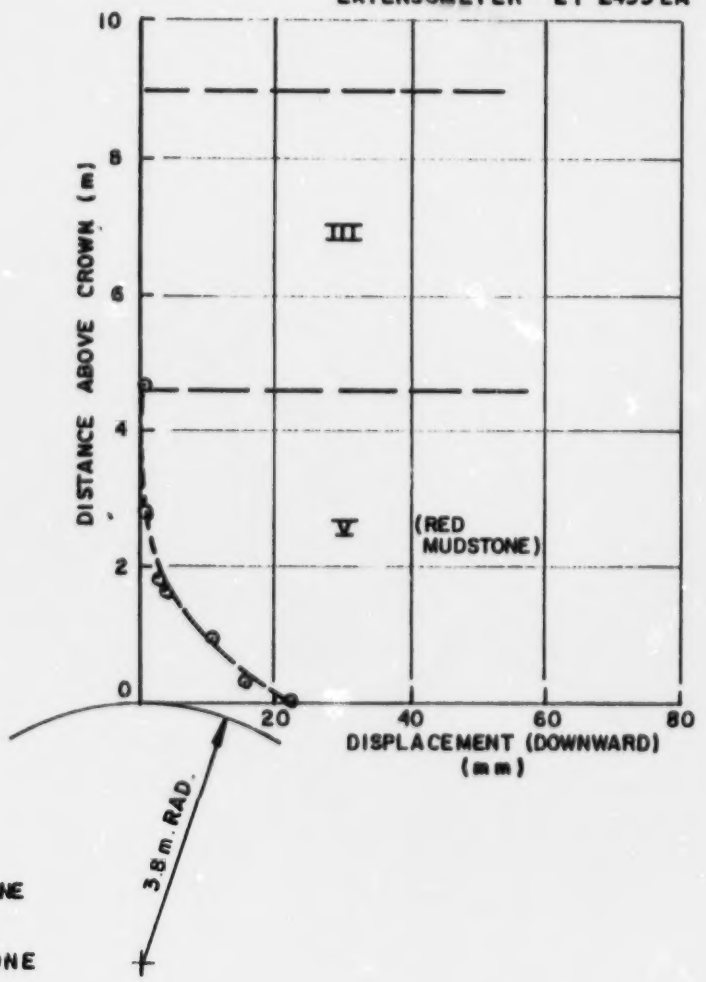
NOTE: EXTENSOMETER INSTALLED AT FACE

EXTENSOMETER 2T 2263 EA



NOTE: EXTENSOMETER INSTALLED AT 41m. FROM FACE

EXTENSOMETER 2T 2433 EA



LEGEND

I - SANDSTONE
II - INTERBEDDED SANDSTONE - SILTSTONE
III - SILTSTONE
IV - INTERBEDDED SILTSTONE / MUDSTONE
V - MUDSTONE
VI - CARBONACEOUS MUDSTONE
VI A - COAL

Drawn D.M.
Chkd. C

DISTRIBUTION OF DISPLACEMENT WITH DEPTH ABOVE TUNNEL CROWN (CH. 2263 m. CH. 2433 m.)

FIGURE II-3.6

DISTRIBUTION OF DISPLACEMENT WITH DEPTH ABOVE TUNNEL CROWN (CH. 2749 m.) (CH. 2996 m.)

FIGURE II-3.7

Date MAY 6, 1985

Project 831-6014

Golder Associates

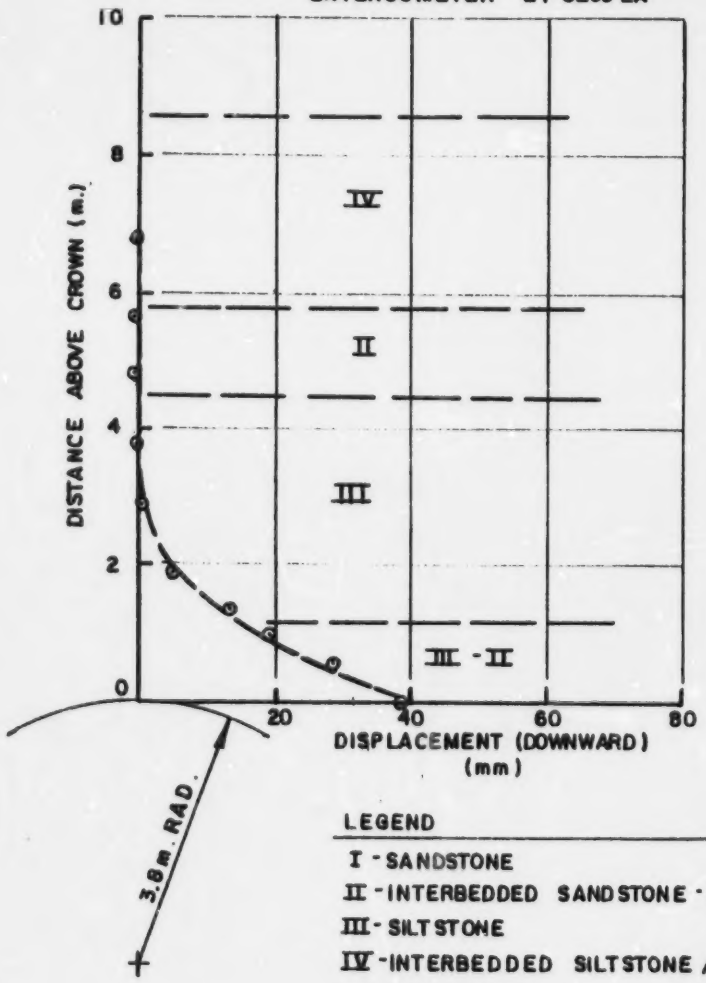
Drawn D.M.

Chkd.

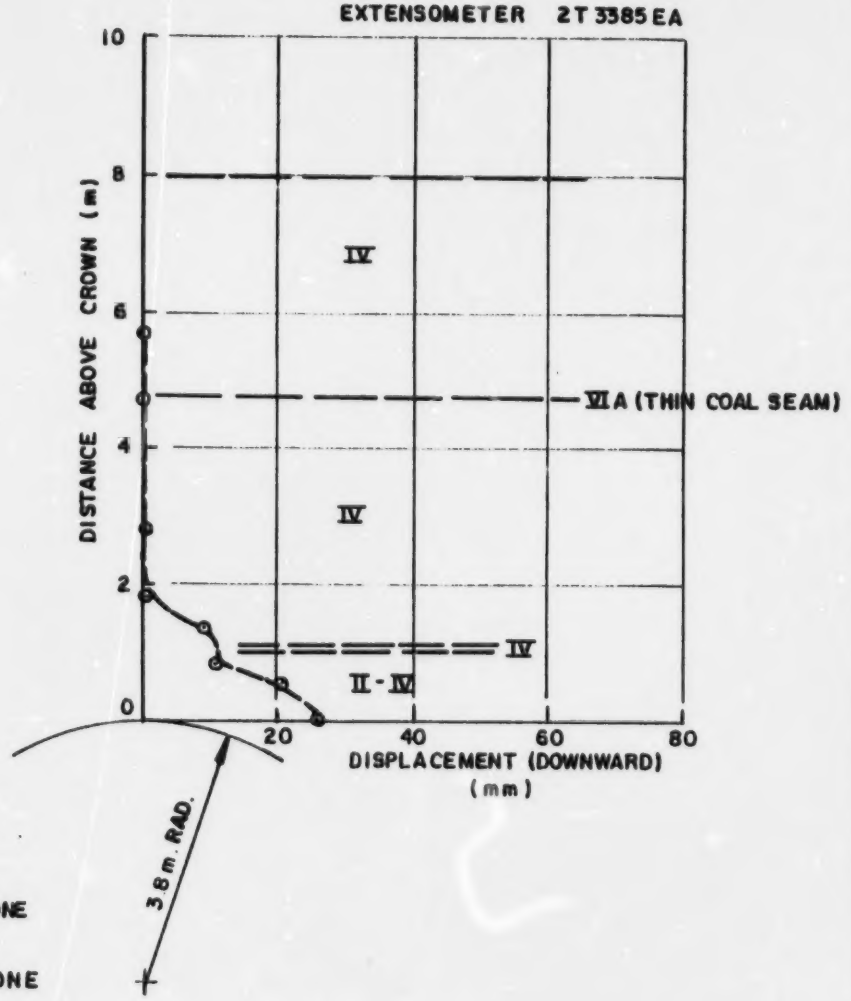
Date MAY 6, 1985
Project 851-6014

Golder Associates

NOTE : EXTENSOMETER INSTALLED AT FACE



NOTE : EXTENSOMETER INSTALLED AT 8m. FROM FACE



LEGEND

I - SANDSTONE
II - INTERBEDDED SANDSTONE - SILTSTONE
III - SILTSTONE
IV - INTERBEDDED SILTSTONE / MUDSTONE
V - MUDSTONE
VI - CARBONACEOUS MUDSTONE
VI A - COAL

Drawn D.M.
Chkd.

DISTRIBUTION OF DISPLACEMENT WITH DEPTH ABOVE TUNNEL CROWN (CH. 3205 m.) (CH. 3385 m.)

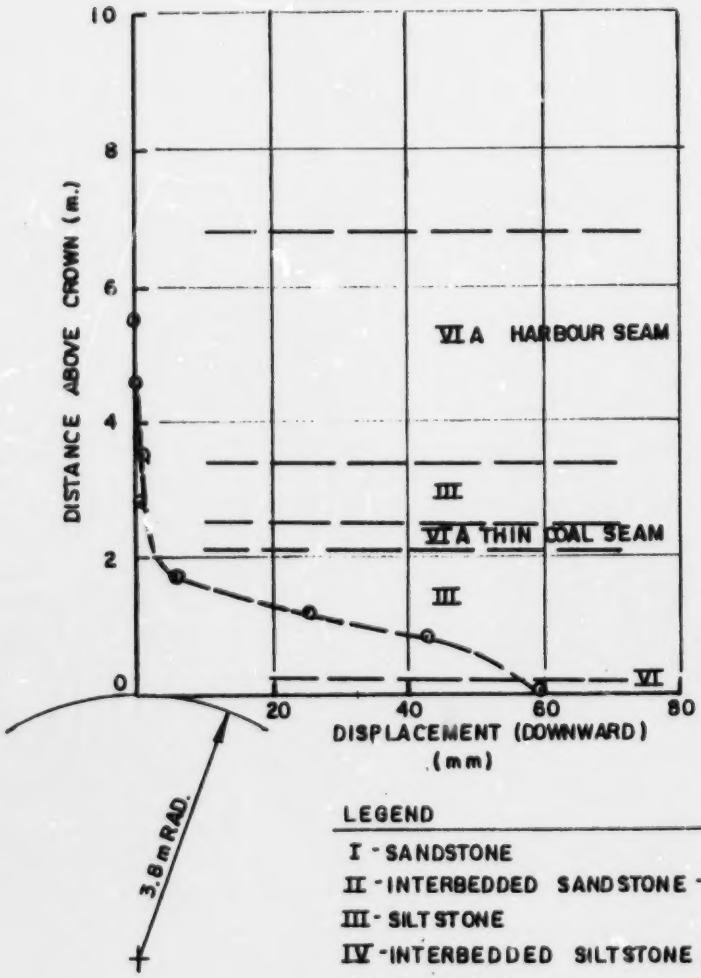
FIGURE II-3.8

Date MAY 6,1985
Project 831-6014

Golder Associates

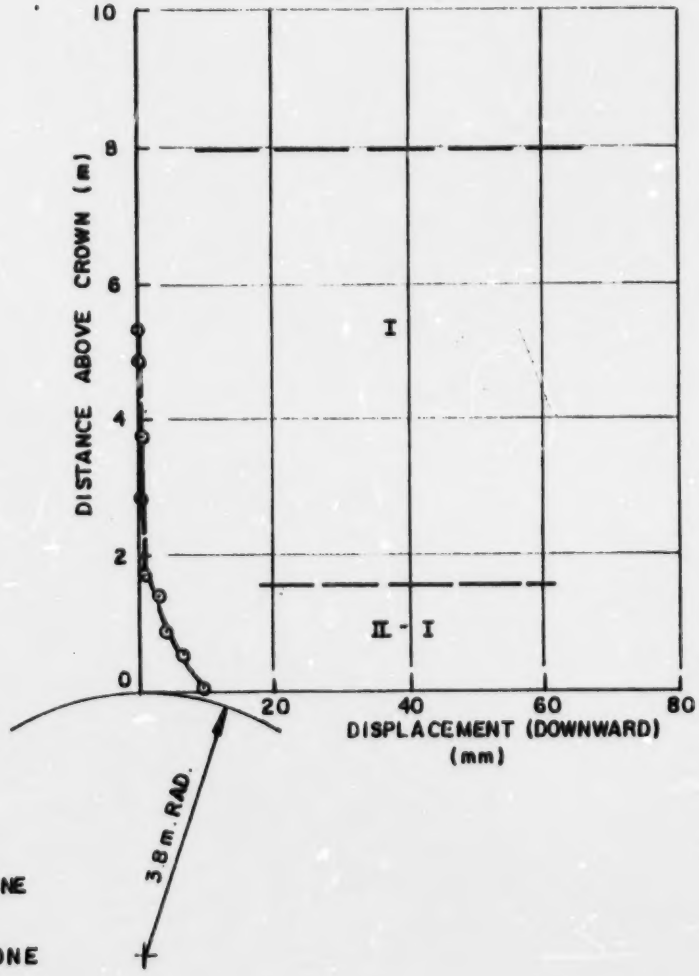
NOTE : EXTENSOMETER INSTALLED AT FACE

EXTENSOMETER 2T 3457 EA



NOTE : EXTENSOMETER INSTALLED AT 62m. FROM FACE

EXTENSOMETER 2T 3522 EA



LEGEND

I - SANDSTONE
II - INTERBEDDED SANDSTONE - SILTSTONE
III - SILTSTONE
IV - INTERBEDDED SILTSTONE / MUDSTONE
V - MUDSTONE
VI - CARBONACEOUS MUDSTONE
VI A - COAL

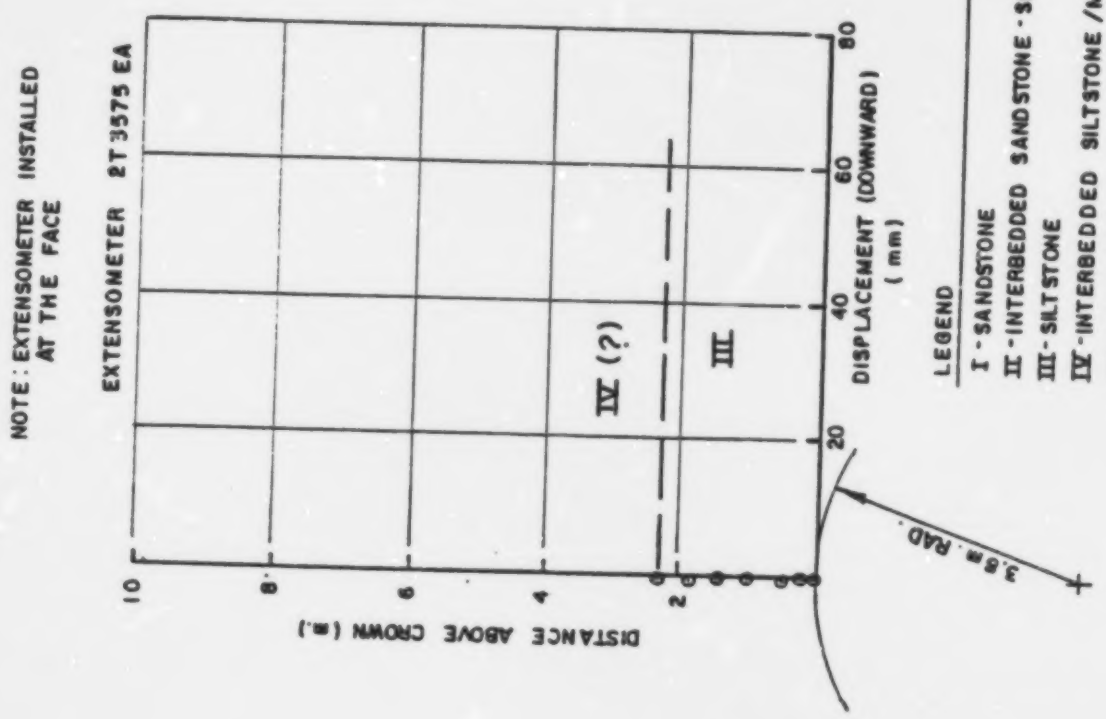
Drawn D.M.
Chkd.

DISTRIBUTION OF DISPLACEMENT WITH DEPTH ABOVE TUNNEL CROWN (CH.3457m. AND CH.3522m.)

FIGURE II-3.9

DISTRIBUTION OF DISPLACEMENT WITH DEPTH ABOVE TUNNEL CROWN (CH. 3575)

FIGURE II-3.10



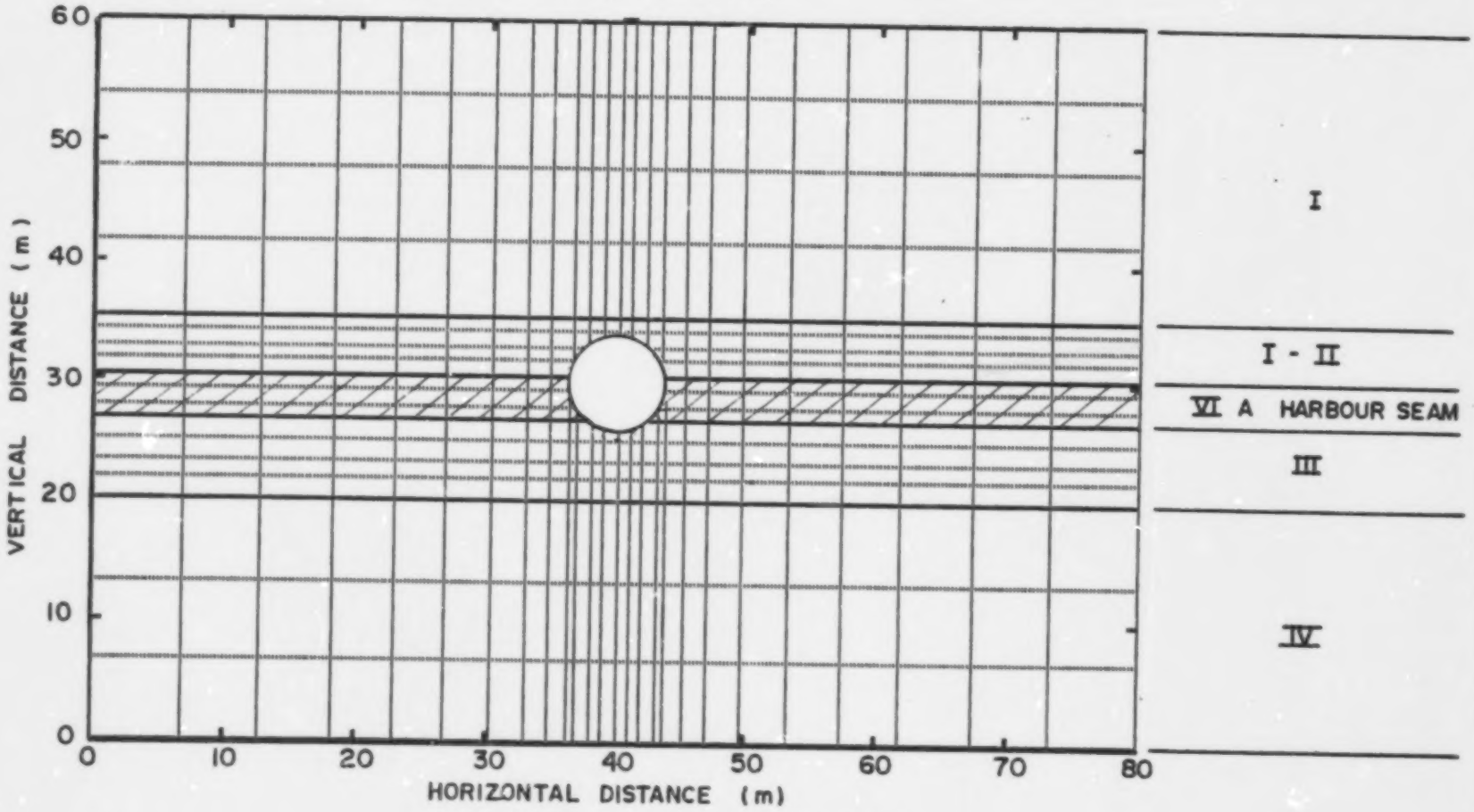
Date MAY 6, 1985
Project 831-6014

Golder Associates

Drawn G.P.
Chkd.

Form G.A.-U.-4 (M)

NOTE: EACH RECTANGULAR ELEMENT SHOWN COMPRISES TWO (2) TRIANGULAR ELEMENTS.



ROCK TYPES

I SANDSTONE
II INTERBEDDED SANDSTONE - SILTSTONE
III SILTSTONE
IV INTERBEDDED SILTSTONE / MUDSTONE
V MUDSTONE
VI CARBONACEOUS MUDSTONE VIA COAL

Date MAY 9, 1985
Project 831-6014

Golder Associates

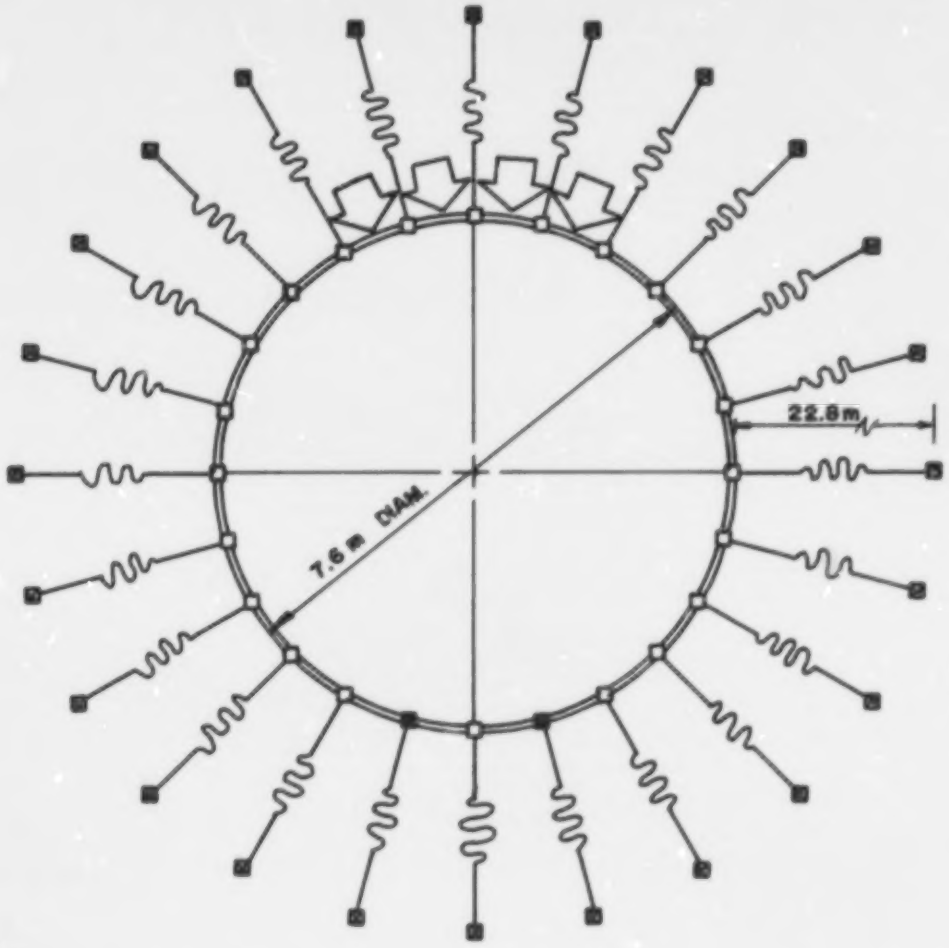
Drawn D.M.
Chkd.

TYPICAL FINITE ELEMENT GRID FOR STRESS ANALYSIS OF TUNNEL No. 2 (CH. 3522 m.)

FIGURE II-3.11

SET-UP OF FINITE ELEMENT MODEL FOR ROCK - SUPPORT INTERACTION ANALYSIS

FIGURE II-4.1



NOTE

- NODES ON TUNNEL LINER ARE EQUALLY SPACED.
- NOT DRAWN TO SCALE.

LEGEND

- NODE.
- LATERALLY RESTRAINED NODE.
- FIXED NODE.
- BAR ELEMENT REPRESENTING TUNNEL LINER (RING BEAM).
- BAR ELEMENT REPRESENTING ROCK.
- NORMAL LOAD ON LINER ELEMENTS.

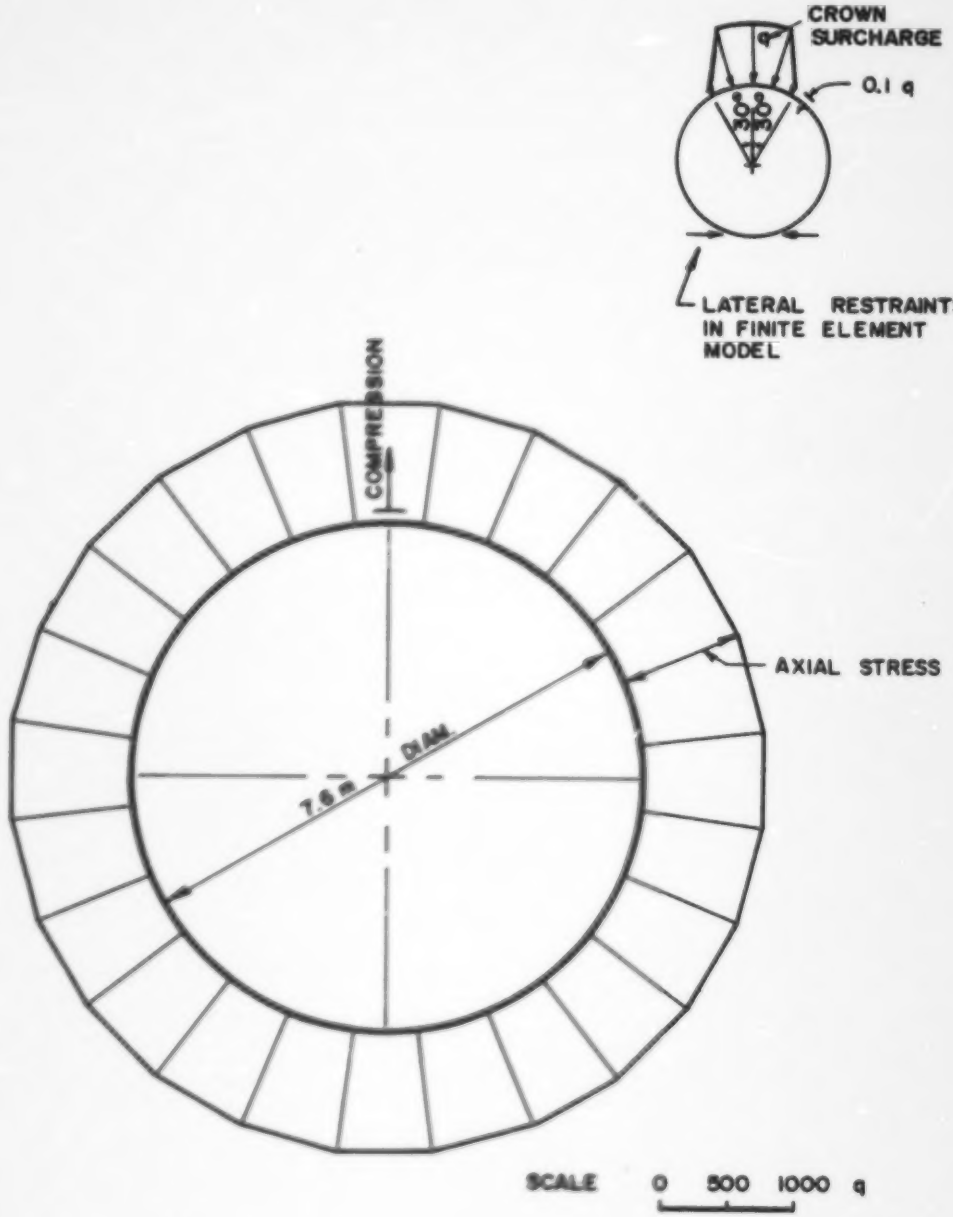
Date MAY 10, 1985
Project 851-6014

Golder Associates

Drawn LL
Chkd. GJ

DISTRIBUTION OF NORMALIZED AXIAL STRESS IN RING BEAM

FIGURE II-4.2



Date MAY 10, 1985
Project 831-6014

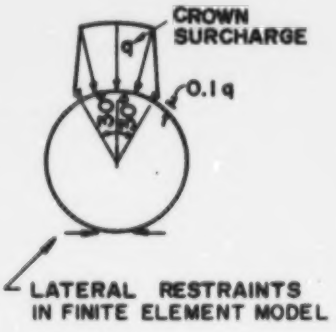
Golder Associates

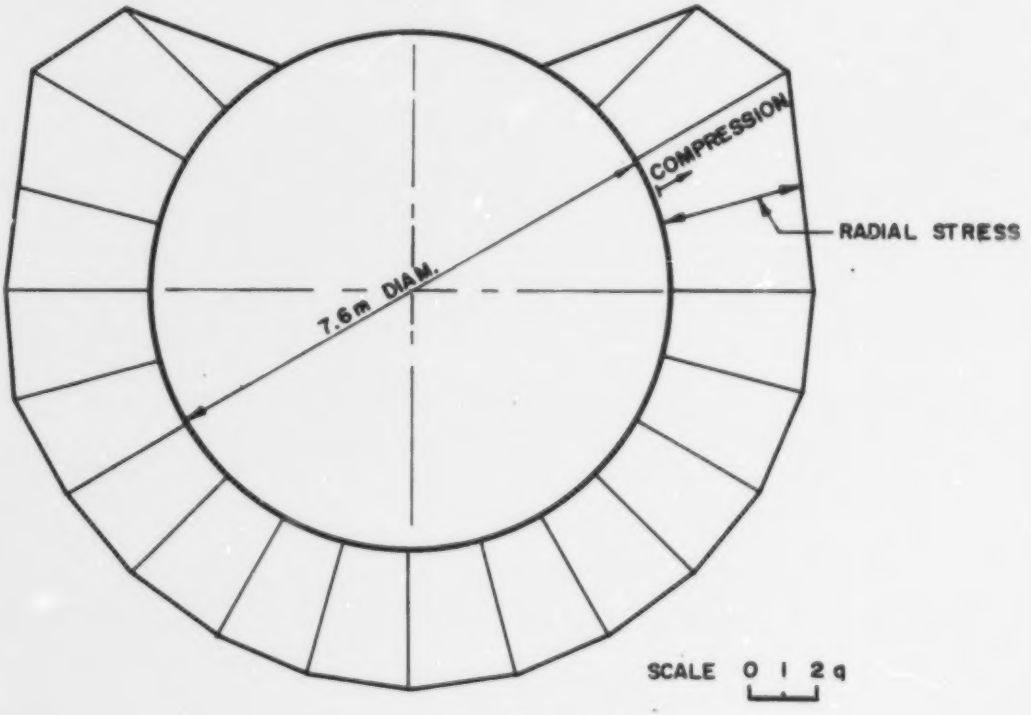
Drawn L L
Chkd.

Form G.A.-D.-4 (M)

DISTRIBUTION OF NORMALIZED RADIAL ROCK STRESS

FIGURE II-4.3





NOTE : THE CROWN SURCHARGE IS APPLIED OVER A DISTANCE OF 1.5m ALONG THE TUNNEL AND THE RADIAL STRESS SHOWN AT THE RING BEAM /ROCK CONTACT.

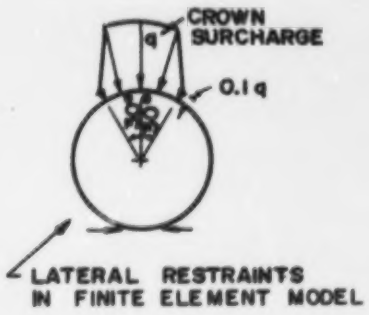
Date MAY 10, 1985
Project 831 - 6014

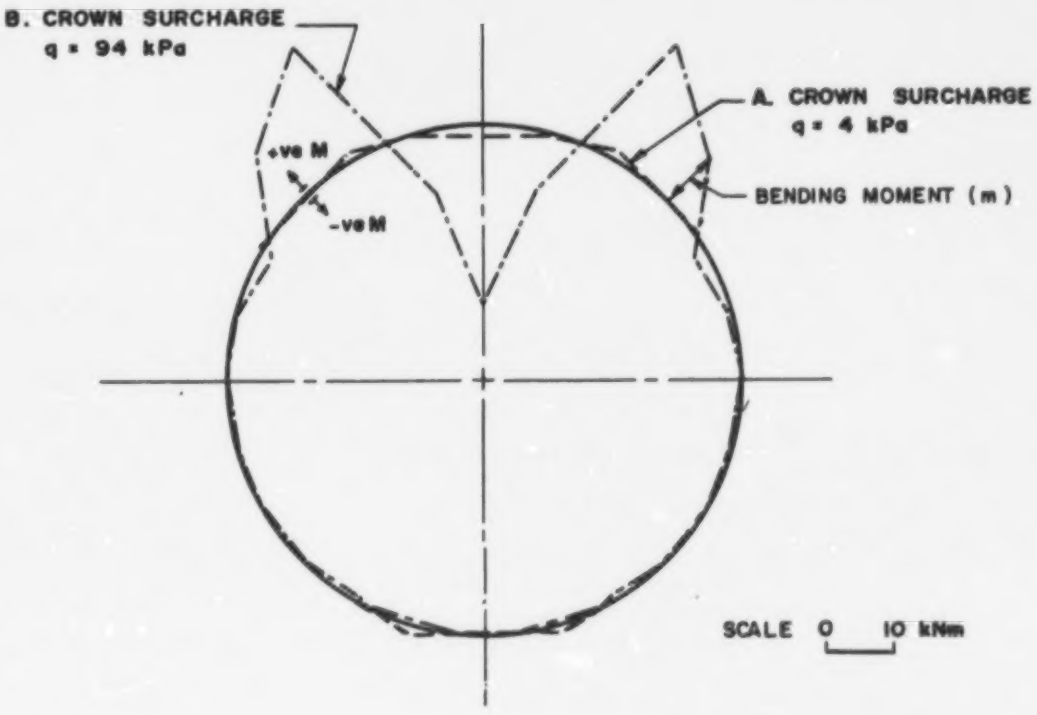
Golder Associates

Drawn L L
Chkd. S.Y.

DISTRIBUTION OF BENDING MOMENT IN RING BEAM

FIGURE II-4.4





Form G.A.-D-4 (M)

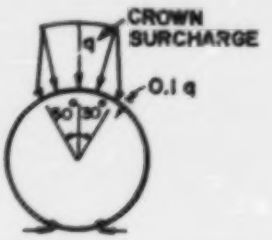
Date MAY 10, 1985
Project 831-6014

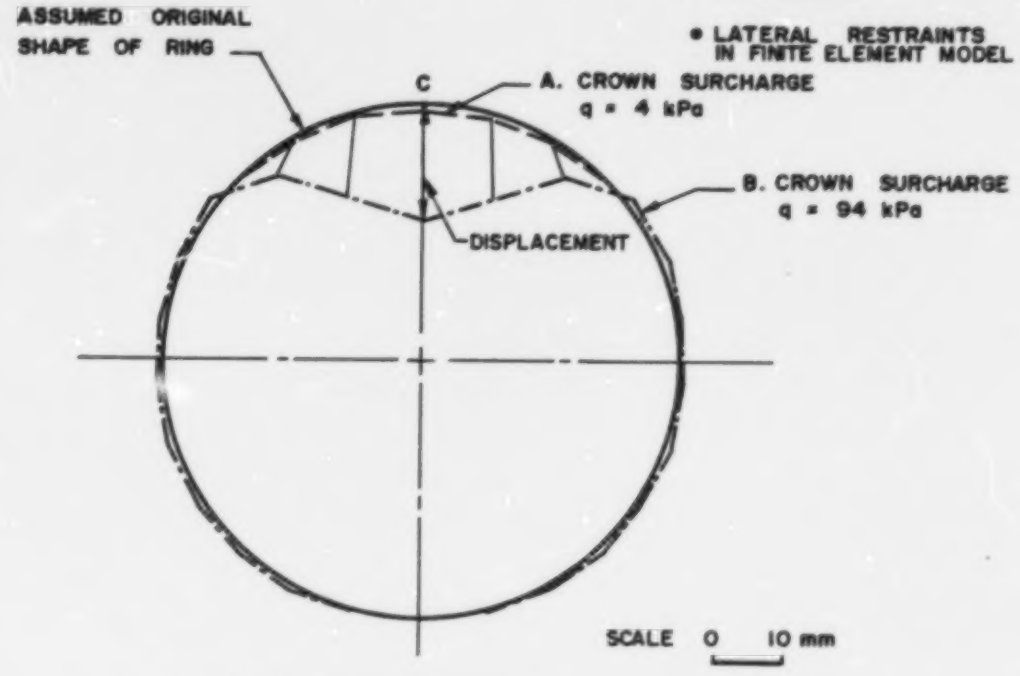
Golder Associates

Drawn LL
Chkd.

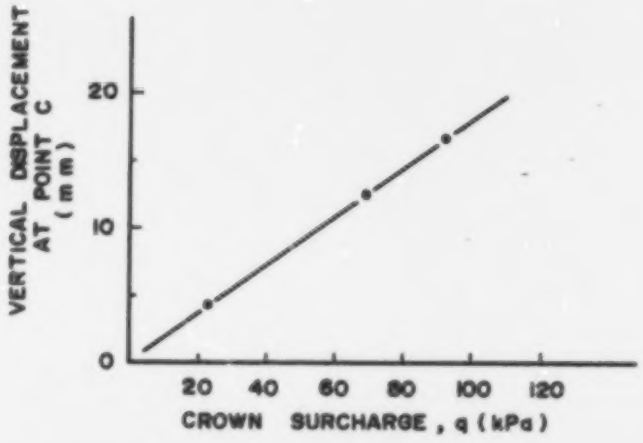
DISTRIBUTION OF RING BEAM DISPLACEMENT

FIGURE II-4.5




ASSUMED ORIGINAL SHAPE OF RING
• LATERAL RESTRAINTS IN FINITE ELEMENT MODEL
C
A. CROWN SURCHARGE q = 4 kPa
B. CROWN SURCHARGE q = 94 kPa
DISPLACEMENT
SCALE 0 10 mm

a) DEFORMATION PROFILE



b) VARIATION OF VERTICAL DISPLACEMENT AT CROWN (POINT C) WITH CROWN SURCHARGE

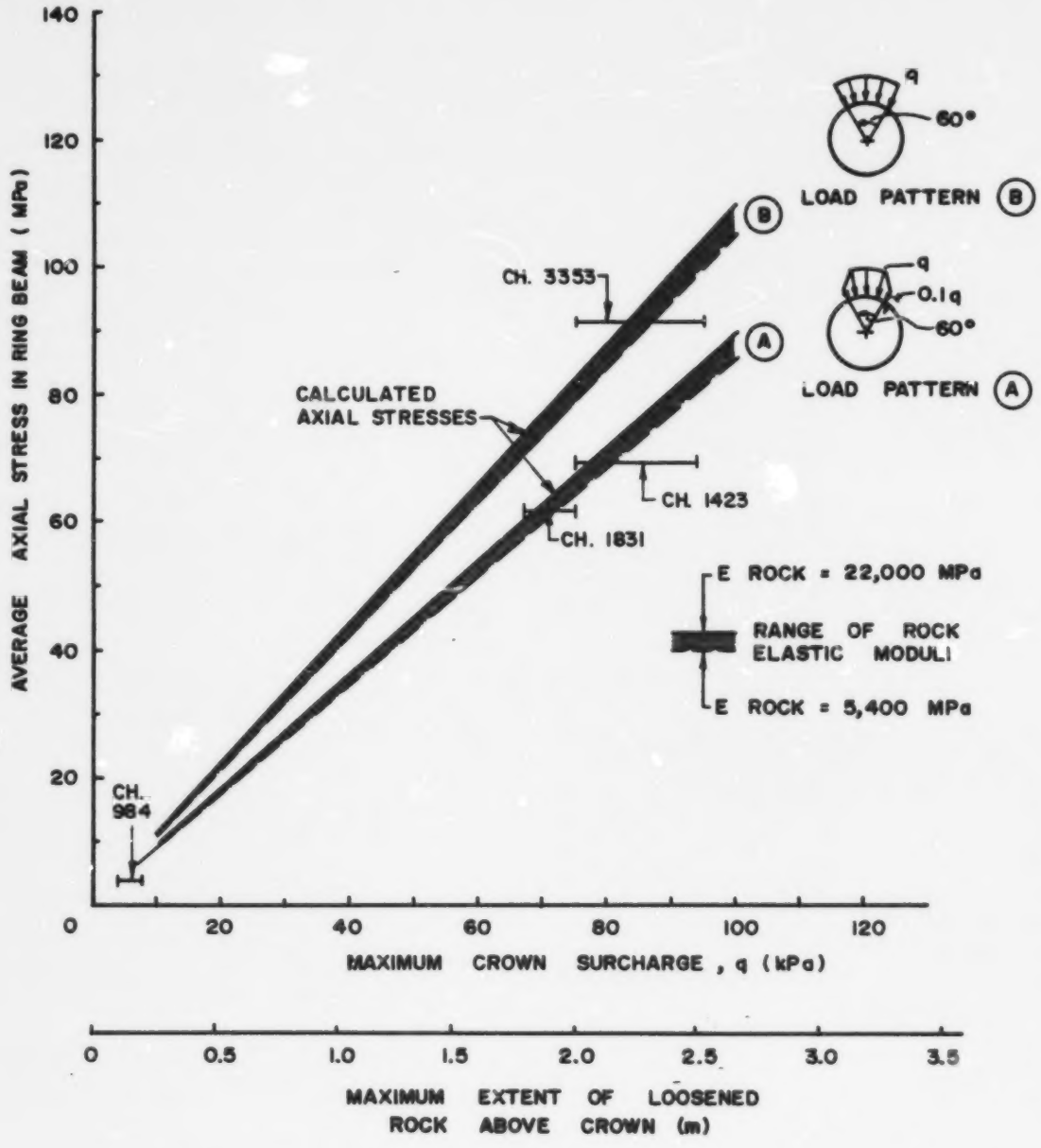
Date MAY 10, 1985
Project 831-6014

Golder Associates

Drawn L.L.
Chkd.

VARIATION OF AVERAGE AXIAL STRESS IN RING BEAM WITH CROWN SURCHARGE

FIGURE II-4.6



LEGEND

⊢ MEASURED AVERAGE AXIAL STRESS IN RING BEAM PLOTTED WITH RANGE OF LOOSENED ROCK AT THE CROWN ESTIMATED ON THE BASIS OF NEAR-BY EXTENSOMETER DATA.

Date MAY 10, 1985
Project 831-6014

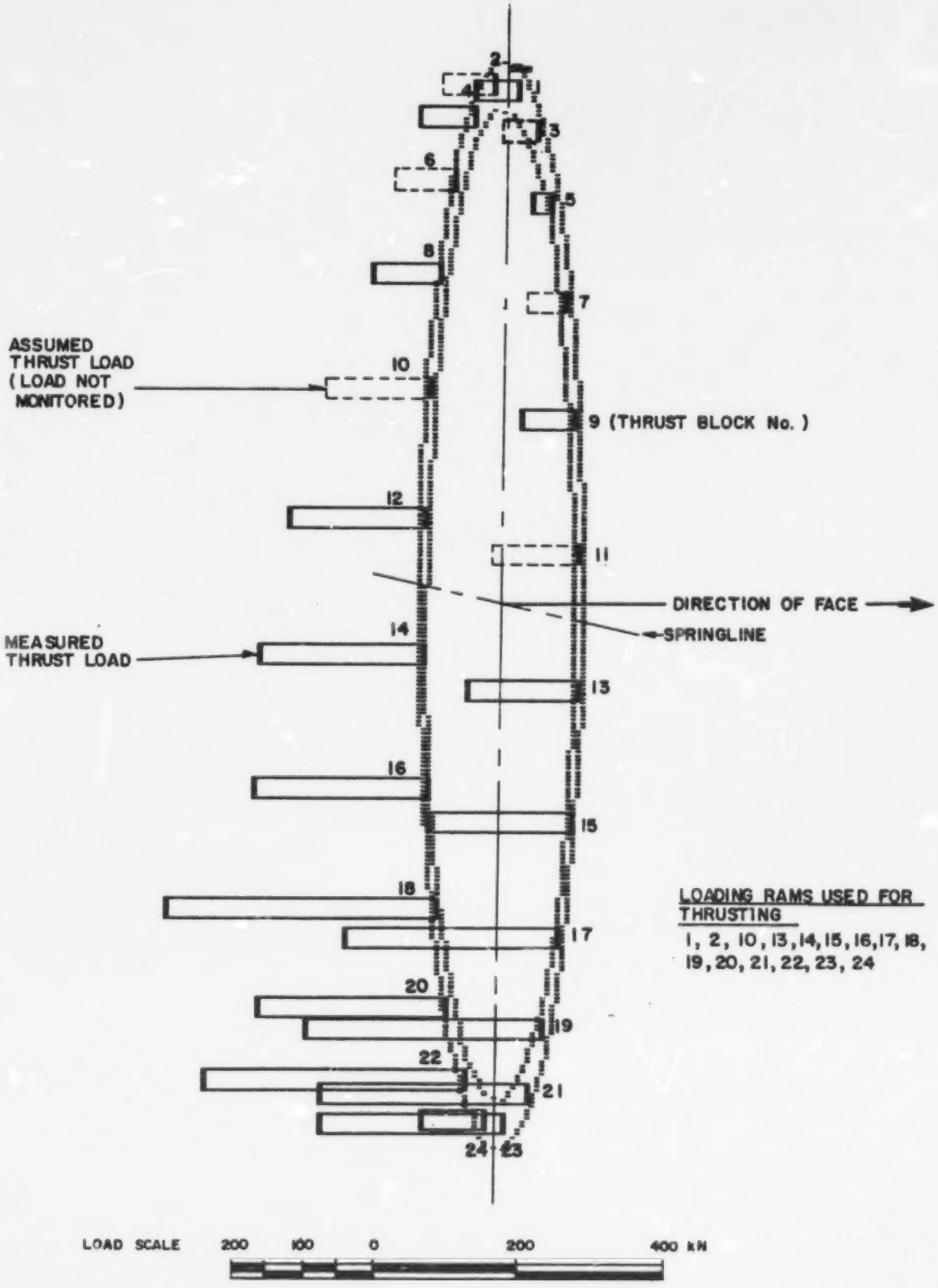
Golder Associates

Drawn LL
Chkd. SJ

Form G.A.-D-4 (M)

MAXIMUM THRUST LOADING DURING PUSHING - CHAINAGE 984m (SANDSTONE)

FIGURE II-5.1



Date FEB. 25, 1985

Project 85L-5014

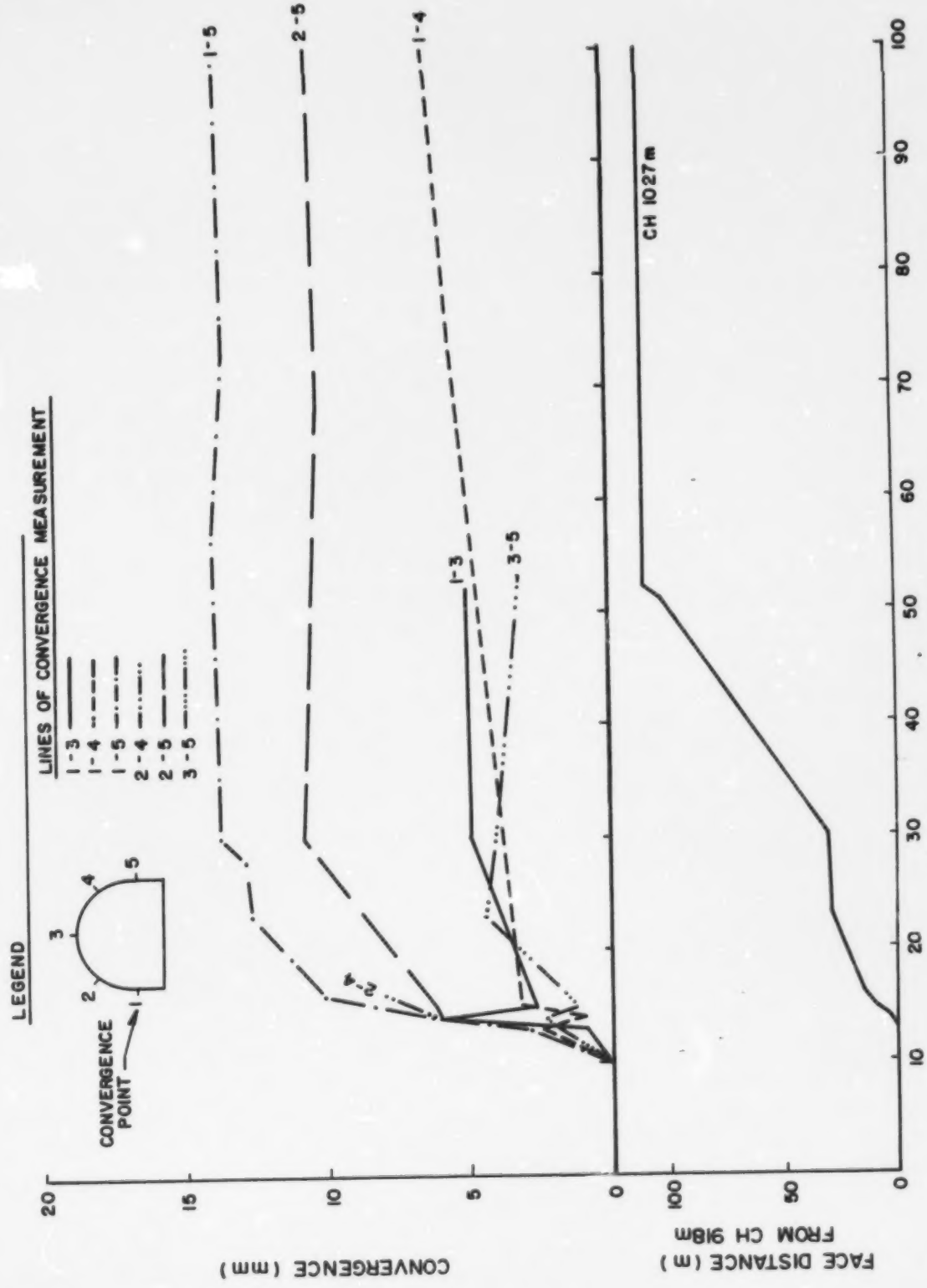
Golder Associates

Drawn G. P.

Chkd.

CONVERGENCE DATA AT CH 918m
(TUNNEL No. 3)

FIGURE II-7.1



Date JUNE 3, 1984
Project 831-6014

Golder Associates

Drawn G.P.
Chkd.

Form G.A.-D.-4 (M)

Volume

3

Resources Canada
CANMET
Canada Centre for Mineral and Energy Technology.

Ressources Canada
Centre canadien de la technologie des minéraux et de l'énergie.

CANMET CONTRACT REPORT

No. 26SQ.23440-2-9159

CONTRACT REPORT NUMBER 1SQ82-00233

MEASUREMENT AND ANALYSIS OF ROCK DEFORMATION AND SUPPORT SYSTEM RESPONSE IN THE DRILL AND BLAST AND BORED ACCESS DRIVAGES AT THE DONKIN - MORIEN PROJECT (UP-G198)

VOLUME III - APPENDICES A & B

prepared by

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

Work on this project was conducted under the auspices of the Canada Centre for Mineral and Energy Technology, Energy, Mines and Resources Canada

JUNE 1985

Canada

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

REPORT TO
CANMET

MEASUREMENT AND ANALYSIS OF ROCK DEFORMATION AND SUPPORT SYSTEM RESPONSE IN THE DRILL AND BLAST AND BORED ACCESS DRIVAGES AT THE DONKIN-MORIEN PROJECT (UP-G-198)

VOLUME III - APPENDICES A AND B

VOLUME I - DATA REPORT
VOLUME II - ANALYSIS OF DATA
VOLUME III - APPENDICES A AND B
VOLUME IV - APPENDICES C, D AND E

MAR 3 1986
MICROMEDIA

657 pp

June 1985

831-6014

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VOLUME III

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B-2	Stress Measurement Report	

APPENDIX A

DAILY REPORTS
BLASTING RECORDS

APPENDIX A-1

TUNNEL NO. 2 - DAILY REPORTS

DONKIN-MORIEN DEVELOPMENT PROJECT

DAILY REPORT OF

TBM DRIVAGE

TUNNEL NO. 2

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 03,1984
Chainage :Start 227.47 m
End 227.47 m
Advance for day 0.00 m

File Name: DY01-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND & NEW YEARS HOLIDAY
8.00	16.30	MINING PREPARATION		-	-	-	MOUNTED WEST SIDE WATER SPRAY NOZZLE INSTALLED 2 LENGTHS OF 42" FLEXIBLE VENTILATION TUBING ON WEST SIDE INSTALLED 7 LENGTHS OF MONORAIL FOR ELECTRICAL CABLE ON THE WEST SIDE INSTALL MISSING BOLTS & PLATES FOR PREVIOUSLY ERECTED RINGS INSTALLED FLOOR GRATING ON EAST SIDE & BETWEEN TRACK
		-- SHIFT CHANGE------					
16.30	24.00	MINING PREPARATION		-	-	-	INSTALL FLOOR BEAM CHAIRS & FLOOR BEAMS TO CH. 175.2m. INSTALL RAIL TRACK & FLOOR GRATING HOOK UP BELT LINE SAFETY SWITCH HOOK UP ELECTRICAL CABLE SUPPORT ROLLERS (19 HANGERS)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JAMANUARY 04,1984
Chainage :Start 227.47 m
End 227.47 m
Advance for day 0.00 m

File Name: DY01-04A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					
		-- SHIFT CHANGE------					
8.00	16.30	MINING PREPARATION		-	-	-	INSTALL 40 FT. OF AIR & WATER HOSE
							HOOK UP ELECTRICAL CABLE SUPPORT ROLLERS(TOTAL = 24)
							INSTALL GRATING TO CH. 169.2m.
							INSTALL LEG SUPPORTS
							INSTALL SF6 SWITCH ON LAST SECONDARY CONVEYOR SKID
							WELD HOOKS ON SECONDARY CONVEYOR STRUCTURE FOR ELECTRICAL CABLES
		-- SHIFT CHANGE------					
16.30	24.00	MINING PREPARATION		-	-	-	HAUL MAIN ELECTRICAL CABLES THROUGH SUPPORTS
							INSTALL GRATING
							WELD STAND FOR HYDRLC. OIL BARRELS
							INSTALL SAFETY CHAIN ON CATWALK
							TRANSPORT 1 CASSETTE INTO POSITION
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 05,1984 File Name: DY01-05A
Chainage :Start 227.47 m
End 227.47 m Project No: 831-6014
Advance for day 0.00 m

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
0.00	8.00	NO WORK CARRIED OUT					
8.00	16.00	MINING PREPARATION		-	-	-	INSTALL VENTILATION CASSETTE
		-- SHIFT CHANGE------					CONNECT 3 SPEAKERS FOR O/H CONVEYOR
16.00	24.00	MINING PREPARATION		-	-	-	MOVE VENTTUBING AWAY FROM CATWALK
							INSTALL SAFETY POSTS ON CATWALK
							CLEAN UP AROUND L-240 DRIVE
							ATTACH GMT-MAN CARRIER TO TRIP
							LOWER 2ND. CASSETTE DOWN TUNNEL
							INSTALL AIR HEADER ON T.B.M. CUTTERHEAD
							REPAIR BROKEN AIR LINE
							CUT & INSTALL FLOOR BEAM POSTS FOR HIGH AREAS IN INVERT
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 06,1984 File Name: DY01-06A
Chainage :Start 227.47 m
End 227.47 m Project No: 831-6014
Advance for day 0.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					
		-- SHIFT CHANGE------					
8.00	16.00	MINING PREPARATION		-	-	-	FORMED & POURED A BLOCK FOR MOUNTING THE LAZER, FLOOR BEAMS & TRACK INSTALLATIONS
							WORK ON HAAK CONVEYOR
							WORK ON VENTILATION CASSETTES
							MADE UP & CONNECTED AIR HOSE TO NEW HEADER(INSTALLED ON T.B.M. PREVIOUS NIGHTSHIFT)
		-- SHIFT CHANGE------					
16.00	24.00	MINING PREPARATION		-	-	-	INSTALL SECOND CASSETTE FRAME
							INSTALL FLOOR BEAM POSTS & CROSS BEAMS
							INSTALL U-TUBING ON WEST SIDE
							CLEAN UP AROUND SKIDS
							WELD STACKER HOPPER
							REPLACE WEDGES & BOLTS IN RINGS(SMALL WEDGES NOT ACCEPTED)
							ADJUST TENSION ON TAKE UP LOOP & RUN CONVEYOR
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 09,1984
Chainage :Start 227.47 m
End 228.51 m
Advance for day 1.04 m

File Name: DY01-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					
		-- SHIFT CHANGE------					
8.00	16.00	MINING PREPARATION		-	-	-	CLEAN UP AROUND T.B.M.
							HOOK UP AIR LINE & ALIGN MAIN BELT
							INSTALL CASSETTE STRUCTURE
							INSTALL LIGHTING TRANSFORMER(SKID NO.3)
							START TO INSTALL GUARD ON CONVEYOR LOOP TAKE UP
							LOWER SFG SWITCH FOR THE DE-REELER
							SYSTEM INTO PLACE & ANCHOR IT TO THE FLOOR BEAM
							INSTALL METAL CLADING(PORTAL ENCLOSURE)
							PUT BRAKE BACK IN PLACE(L-240 DRIVE)
		-- SHIFT CHANGE------					
16.00	21.00	MINING PREPARATION		-	-	-	COMPLETION OF MINING PREPARATION
21.00	21.12	MINING PREPARATION					START UP T.B.M.
21.12	22.04	MINING		0.35	5-24	13000	COMPLETED PUSH
22.04	22.30	LUNCH					
22.30	22.35	DELAY					NO ACCOUNT FOR TIME IN ACTIVITY SHEET
22.35	23.15	RING INSTALLATION	119				
23.15	23.20	DELAY					NO ACCOUNT FOR TIME IN ACTIVITY SHEET
23.20	23.52	MINING		0.69	5,7,9-24	11000	INCOMPLETE PUSH
23.52	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 10,1984 File Name: DY01-10A
Chainage :Start 228.51 m
End 237.20 m Project No: 831-6014
Advance for day 8.69 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.35	MINING		-	-	-	INCOMPLETE PUSH
0.35	0.55	DELAY					BELT LINE DOWN (SWITCH OFF ACCIDENTLY)
0.55	1.40	MINING		0.81	5-24	10-15000	COMPLETED PUSH
1.40	2.10	RING INSTALLATION	120				
2.10	2.40	DELAY					LOWER CONVEYOR CHUTE
2.40	4.15	MINING		1.50	5-24	10-15000	-
4.15	4.45	RING INSTALLATION	121				
4.45	5.20	LUNCH					
5.20	5.30	DELAY					PULL SKID AHEAD
5.30	7.10	MINING		1.50	5-24	10-15000	-
7.10	8.00	RING INSTALLATION	122				
		-- SHIFT CHANGE------					
8.00	16.00	NO WORK CARRIED OUT					
16.00	16.21	-- SHIFT CHANGE------					
16.21	16.28	MINING		-	-	-	INCOMPLETE PUSH
16.28	16.43	DELAY					BELT SLIPPING
16.43	17.57	MINING		1.50	5,7,9-24	10.5-13000	COMPLETED PUSH
17.57	18.28	LUNCH					
18.28	18.53	RING INSTALLATION	123				
18.53	20.03	MINING		1.50	5,7,9-24	13000	-
20.03	20.53	LUNCH					
20.53	21.15	RING INSTALLATION	124				
21.15	22.50	MINING		1.50	5-24	12.5-13500	-
22.50	23.20	RING INSTALLATION	125				
23.20	23.42	MINING		0.38	5-24	13000	INCOMPLETE PUSH
23.42	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 11,1984
Chainage :Start 232.20 m
End 244.45 m
Advance for day 12.25 m

File Name: DY01-11A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.20	DELAY					
0.20	0.50	MINING		-	-	-	CHANGE MOTOR MODULE INCOMPLETE PUSH
0.50	1.05	DELAY					T.B.M. DOWN (ELECTRICAL PROBLEMS)
1.05	1.15	MINING		-	-	-	INCOMPLETE PUSH
1.15	2.00	DELAY					MAIN CONVEYOR DOWN (BELT RIDING HIGH)
2.00	2.40	MINING		1.12	6-28	15000	COMPLETED PUSH
2.40	3.00	RING INSTALLATION	126				
3.00	3.10	DELAY					PULL SKID AHEAD
3.10	4.40	MINING		1.50	6-28	15000	-
4.40	5.00	RING INSTALLATION	127				
5.00	5.20	DELAY					MAIN CONVEYOR DOWN (BRLT RIDING HIGH)
5.20	7.00	MINING		1.40	6-28	15000	
7.00	7.40	RING INSTALLATION	128				
7.40	8.00	MINING		0.10	6-28	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #32,35,36,37. ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	18.25	DELAY		-	-	-	BELT RIDING HIGH ON SURFACE STACKER
18.25	18.29	MINING		0.34	6-28	15000	INCOMPLETE PUSH(NO LAZER)
18.29	18.40	DELAY					ELECTRICAL PROBLEMS(DIODE REPLACED)
18.40	18.45	MINING		-	-	-	INCOMPLETE PUSH(NO LAZER)
18.45	19.15	DELAY					MAIN BELTLINE RIDING HIGH
19.15	20.40	MINING		1.06	5-25	15000	COMPLETED PUSH
20.40	21.15	RING INSTALLATION	129				
21.15	22.40	MINING		1.50	5-24	11.5-15500	-
22.40	23.05	RING INSTALLATION	130				
23.05	23.30	DELAY		-	-	-	OBTAIN LAZER AT TARGETS MOVE HOSES & RAISE PLATFORM NEAR CONTROL CABIN
23.30	23.45	MINING		0.23	5-24	11.5-15000	ENLARGED GUSSET HOLE INCOMPLETE PUSH
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 12,1984 File Name: DY01-12A
Chainage :Start 244.45 m
End 249.87 m Project No: 831-6014
Advance for day 5.42 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.30	MAINTENANCE		-	-	-	CHECK CUTTERS
0.30	5.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #25,26,38,42A,43A.
5.00	5.55	MINING		1.27	6-24	15000	COMPLETED PUSH
5.55	6.15	RING INSTALLATION	131				
6.15	7.30	MINING		1.50	6-24	15000	-
7.30	8.00	DELAY					REPAIR PUSH-RING RETRACTING CYLINDER
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #30,33,43B,42B. ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	19.00	DELAY		-	-	-	INSTALL NEW CABLE(SKID),HYDRLC FITTINGS COMPLETE FLOOR BEAM & RAIL WORK
19.00	19.41	RING INSTALLATION	132				
19.41	19.53	MINING		-	-	-	INCOMPLETE PUSH
19.53	20.25	DELAY					MAIN CONVEYOR RIDING TO ONE SIDE
20.25	20.47	MINING		-	-	-	INCOMPLETE PUSH
20.47	21.14	DELAY					MAIN CONVEYOR RIDING HIGH
21.14	22.12	MINING		1.50	5-24	10-15000	COMPLETED PUSH
22.12	22.33	RING INSTALLATION	133				
22.33	23.47	MINING		1.10	5-24 1-4,9-24 1,3,5,7,9-24	10-15000	INCOMPLETE PUSH(DIFFERENT RAMS USED THROUGHOUT PUSH)
23.47	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 13,1984
Chainage :Start 249.87 m
End 250.42 m
Advance for day 0.55 m

File Name: DY01-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.30	DELAY		-	-	-	CHECKED T.B.M. DIRECTION (SURVEYORS)
0.30	0.40	DELAY					T.B.M. WATER PUMP DOWN
0.40	1.10	MINING		0.40	9-24	10000	COMPLETED PUSH
1.10	1.35	RING INSTALLATION	134				
1.35	2.00	MINING		0.15	9-24	10000	INCOMPLETE PUSH
2.00	8.00	DELAY		-	-	-	REPAIR TWISTED RINGS & STRUTS
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	PINNED RING #132 WITH 4 SETS OF PINS
							REPLACE THRUST BEAMS WHICH WERE
							DISPLACED WHILE MINING ON BACKSHIFT
							USE SHORTER THRUST BEAMS(RING #120-121)
							PINNED RING #131 WITH 4 SETS OF PINS
		-- SHIFT CHANGE------					
16.00	17.24	MAINTENANCE		-	-	-	WELD BRACES ON RING #132
17.24	17.30	DELAY		-	-	-	APPLIED PRESSURE FOR MINING & RING BRACE SHEARED
17.30	24.00	DELAY		-	-	-	PINNED RING #132 WITH 4 SETS OF PINS
							INSTALL 40-18 INCH ROCKBOLTS(RING #132)
							INSTALL 6-18 INCH ROCKBOLTS(RING #131)
							CLEAN UP SKID & SURFACE AREA
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project

Rock Support Interaction Study

DAILY REPORT (Tunnel # 2)

Date JANUARY 14,1984 File Name: DY01-14A

Chainage :Start 250.42 m

End 253.57 m Project No: 831-6014

Advance for day 3.15 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.10	DELAY		-	-	-	CHECK RING PINS
0.10	0.15	DELAY					NO ACCOUNT FOR TIME IN ACTIVITY SHEET
0.15	1.20	MINING		1.35	9-24	12000	COMPLETED PUSH
1.20	1.45	RING INSTALLATION	135				PARTIAL INSTALLATION
1.45	2.00	MINING		-	-	-	INCOMPLETE PUSH
2.00	2.15	RING INSTALLATION	135				COMPLETE INSTALLATION
2.15	2.50	MINING		-	-	-	INCOMPLETE PUSH
2.50	3.30	DELAY					T.B.M. DOWN(LOW PRESS. BOOST & PILOT PUMPS)
3.30	4.05	MINING		1.50	9-24	12000	COMPLETED PUSH
4.05	4.40	RING INSTALLATION	136				
4.40	5.45	MINING		0.30	9-24	12000	INCOMPLETE PUSH
5.45	8.00	DELAY					T.B.M. DOWN(LOW PRESSURE BOOST & PILOT PUMPS, CLEAN FILTER)
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 16,1984
Chainage :Start 253.57 m
End 257.57 m
Advance for day 4.00 m

File Name: DY01-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	16.00	NO WORK CARRIED OUT					WEEKEND
		-- SHIFT CHANGE------					
16.00	16.25	DELAY					SET UP TO MINE
16.25	16.40	MINING		-	-	-	INCOMPLETE PUSH
16.40	16.45	DELAY					BELT LINE SHUT DOWN FOR OILING
16.45	17.25	MINING		1.25	1-4,9-24	13000	COMPLETED PUSH
17.25	18.00	RING INSTALLATION	137				
18.00	18.35	MINING		-	-	-	INCOMPLETE PUSH
18.35	18.45	DELAY					T.B.M. DOWN(LOW PILOT PRESSURE)
18.45	19.00	MINING		-	-	-	INCOMPLETE PUSH
19.00	20.20	DELAY					T.B.M.DOWN(LOW PILOT PRESSURE)
20.20	21.30	MINING		1.50	9-24	15000	COMPLETED PUSH
21.30	22.00	RING INSTALLATION	138				
22.00	22.20	MINING		-	-	-	INCOMPLETE PUSH
22.20	22.50	DELAY					RING BENT WHILE MINING(SEAT NOT GOOD)
22.50	24.00	MINING		1.25	9-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 17,1984
Chainage :Start 257.57 m
End 267.82 m
Advance for day 10.25 m

File Name: DY01-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.15	MINING		-	-	-	INCOMPLETE PUSH
0.15	0.50	RING INSTALLATION	139				PARTIAL INSTALLATION(NEW CREW)
0.50	1.05	MINING		-	-	-	INCOMPLETE PUSH
1.05	1.18	RING INSTALLATION	139				PARTIAL INSTALLATION(TOO TIGHT AT TOP)
1.18	1.32	MINING		0.25	9-24	11-15000	COMPLETED PUSH
1.32	1.50	RING INSTALLATION	139				COMPLETE INSTALLATION
1.50	2.57	MINING		1.70	9-24	11-15000	-
2.57	3.10	RING INSTALLATION	140				PARTIAL INSTALLATION(TOO TIGHT AT TOP)
3.10	3.23	MINING		-	-	-	INCOMPLETE PUSH
3.23	3.33	RING INSTALLATION	140				COMPLETE INSTALLATION
3.33	4.50	MINING		1.65	9-24	11-15000	COMPLETED PUSH
4.50	5.15	RING INSTALLATION	141				PARTIAL INSTALLATION
5.15	5.38	MINING		-	-	-	INCOMPLETE PUSH
5.38	5.47	RING INSTALLATION	141				COMPLETE INSTALLATION
5.47	6.10	MINING		-	-	-	INCOMPLETE PUSH
6.10	6.20	DELAY					MAIN CONVEYOR DOWN(TRIPPED ACCIDENTLY)
6.20	7.16	MINING		1.65	9-24	11-15000	COMPLETED PUSH
7.16	7.29	RING INSTALLATION	142				PARTIAL INSTALLATION
7.29	7.43	MINING		-	-	-	INCOMPLETE PUSH
7.43	8.00	RING INSTALLATION	142				COMPLETE INSTALLATION
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #23,38,39,42A,43A. ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	16.41	MINING		1.50	9-24	11-15000	-
16.41	16.58	RING INSTALLATION	143				
16.58	17.52	MINING		1.50	9-24	11-15000	-
17.52	18.07	RING INSTALLATION	144				
18.07	19.00	MINING		1.50	9-24	11-15000	-
19.00	19.13	RING INSTALLATION	145				
19.13	19.30	MINING		0.50	9-24	11-15000	INCOMPLETE PUSH
							GLEN MacKENZIE INJURED,TAKEN TO HOSPITAL FOR X-RAY.
19.30	24.00	DELAY					ASSUMED END OF SHIFT
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 18,1984 File Name: DY01-18A
Chainage :Start 267.82 m
End 274.09 m REVISED Project No: 831-6014
Advance for day 6.27 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.07	-- SHIFT CHANGE------					
0.07	0.51	MINING		-	-	-	INCOMPLETE PUSH
0.51	1.08	RING INSTALLATION	146				PARTIAL INSTALLATION
1.08	1.23	MINING		1.00	1,2,9-24	11.5-12500	COMPLETED PUSH
1.23	1.34	RING INSTALLATION	146				COMPLETE INSTALLATION
1.34	2.40	MINING		-	-	-	INCOMPLETE PUSH
2.40	3.00	RING INSTALLATION	147				PARTIAL INSTALLATION
3.00	3.22	MINING		1.50	1,2,9-24	15000	COMPLETED PUSH
3.22	3.42	RING INSTALLATION	147				COMPLETE INSTALLATION
3.42	4.56	MINING		-	-	-	INCOMPLETE PUSH
4.56	5.27	RING INSTALLATION	148				PARTIAL INSTALLATION
5.27	5.51	MINING		1.50	1,2,9-24	15000	COMPLETED PUSH
5.51	6.04	RING INSTALLATION	148				COMPLETE INSTALLATION
6.04	6.06	MINING		-	-	-	INCOMPLETE PUSH
6.06	6.13	DELAY					RING #147 WASN'T EXPANDED(PUSHED IN ON WEST SIDE) EXPANSION RING PLACED TO HOLD IT IN PLACE.
6.13	7.17	MINING		-	-	-	
7.17	7.28	DELAY					INSTALL MESH & EXPAND RING #147
7.28	7.50	MINING		1.50	1,2,10,12, 13-24	8.5-10500	-
7.50	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #20,29,31,40.
							ASSORTED MACHINE MAINTENANCE
							ANCHORED RING #146 (15 BOLTS) HIGH SIDE
							ANCHORED RING #146 (16 BOLTS) LOW SIDE
							ANCHORED RING #147 (10 BOLTS) HIGH SIDE
							ANCHORED RING #147 (2 BOLTS) LOW SIDE
		-- SHIFT CHANGE------					
16.00	16.10	DELAY					SET UP TO START MINING
16.10	16.35	RING INSTALLATION	149				PARTIAL INSTALLATION
16.35	16.40	DELAY					PULL SKID AHEAD
16.40	17.08	MINING		-	-	-	INCOMPLETE PUSH
17.08	17.18	RING INSTALLATION	149				COMPLETE INSTALLATION
17.18	17.20	MINING		-	-	-	INCOMPLETE PUSH
17.20	19.25	DELAY					PIN RING #148 (STARTED TO TWIST)

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 18,1984 File Name: DY01-18A
Chainage :Start 267.82 m
End 274.09 m REVISED Project No: 831-6014
Advance for day 6.27 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.25	22.30	MINING		1.50	1,3,5,7,9, 14-24	10-15000	COMPLETED PUSH
22.30	22.50	DELAY					REPAIR PLATE ON EXPANSION RING
22.50	23.27	RING INSTALLATION	150				
23.27	24.00	MINING		0.10	1,3,5,7,9, 14-24	10-15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 19,1984
Chainage :Start 274.09 m
End 287.18 m
Advance for day 13.09 m

File Name: DY01-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.28	DELAY		-	-	-	CUTTING HEAD ORIENTATION TROUBLE
							EXPAND RING #149
0.28	1.37	MINING		1.40	1,2,9-24	13500	COMPLETED PUSH
1.37	2.25	RING INSTALLATION	151				TROUBLE INSTALLING TOP MESH
2.25	3.58	MINING		1.50	1,2,9-24	12.5-13500	-
3.58	4.20	RING INSTALLATION	152				
4.20	5.58	MINING		1.50	1,2,9-24	12.5-13500	EXCESSIVE STEERING
5.58	6.12	RING INSTALLATION	153				
6.12	7.39	MINING		1.50	1,2,9-24	13500	-
7.39	8.00	RING INSTALLATION	154				
		-- SHIFT CHANGE------					
8.00	13.47	MAINTENANCE		-	-	-	CHECK CUTTERS
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #152 WITH 12 ROCKBOLTS
13.47	15.14	MINING		1.50	1-4,9-24	12500	-
15.14	15.30	RING INSTALLATION	155				
15.30	16.00	MINING		0.52	1-5,9-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.18	MINING		-	-	-	INCOMPLETE PUSH
16.18	16.40	DELAY					INSTALL MESH(RING #154-155)
							EXPAND RING #154
16.40	17.05	MINING		0.93	1-5,7,9-24	12-15000	COMPLETED PUSH
17.05	17.30	RING INSTALLATION	156				
17.30	17.35	DELAY					WORK ON PRIMARY CONVEYOR
17.35	17.45	DELAY					MOTOR NOS.3 & 4 WILL NOT CUT IN
17.45	19.15	MINING		1.50	1-24	12-15000	-
19.15	19.40	RING INSTALLATION	157				
19.40	21.15	MINING		1.50	1-24	15000	-
21.15	21.45	RING INSTALLATION	158				
21.45	23.15	MINING		1.50	1-4,9-24	15000	-
23.15	24.00	RING INSTALLATION	159				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: JANUARY 20,1984
Chainage: Start 287.18 m
End 291.70 m
Advance for day 4.52 m

File Name: DY01-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	3.05	MINING		-	-	-	INCOMPLETE PUSH (VERY SLOW MINING)
3.05	4.35	MAINTENANCE		-	-	-	CHANGED CUTTER #43A.
4.35	5.25	MINING		1.50	1,2,9-24	10-15000+	COMPLETED PUSH
5.25	6.00	RING INSTALLATION	160				
6.00	8.00	MINING		0.50	1-24	~10-15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED 8 CUTTERS ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	19.40	MAINTENANCE		-	-	-	CHANGED 4 CUTTERS
19.40	21.50	MINING		1.05	1-24	12-15000	COMPLETED PUSH(~STUCK FOR 1 HOUR)
21.50	22.25	RING INSTALLATION	161				
22.25	23.40	MINING		1.50	1-4,9-24	15000	-
23.40	24.00	RING INSTALLATION	162				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 21,1984
Chainage :Start 291.70 m
End 297.70 m
Advance for day 6.00 m

File Name: DY01-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.45	MINING		-	-	-	INCOMPLETE PUSH
0.45	1.12	DELAY					LOOSE BELT ON T.B.M. CONVEYOR
1.12	1.37	MINING		1.50	1,2,9-24	12.5-13500	COMPLETED PUSH
1.37	1.52	RING INSTALLATION	163				
1.52	3.04	MINING		1.50	1,2,9-24	13000	-
3.04	3.28	RING INSTALLATION	164				
3.28	4.38	MINING		1.50	1,2,9-24	13000	-
4.38	5.25	RING INSTALLATION	165				
5.25	6.50	MINING		1.50	1,2,9-24	11.5-13000	-
6.50	8.00	DELAY					WORK ON FLOORBEAMS,TRACK & MUCK OUT SUMP
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 23,1984
Chainage :Start 297.70 m
End 299.25 m
Advance for day 1.55 m

File Name: DY01-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							CHECKED T.B.M. DIRECTION (SURVEYORS)
		-- SHIFT CHANGE------					
16.00	-	MAINTENANCE		-	-	-	RESTITCH T.B.M. CONVEYOR BELT
16.45	18.30	RING INSTALLATION	166				CHANGED 2 CUTTERS
-	21.15						
21.15	21.25	DELAY					NO POWER AT T.B.M.
21.25	22.10	MINING		-	-	-	INCOMPLETE PUSH
22.10	22.40	DELAY					SPLICE T.B.M. BELT & LOW PILOT PRESSURE
22.40	23.35	MINING		1.55	1-4,9-24	12-14000	COMPLETED PUSH
23.35	24.00	RING INSTALLATION	167				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 24,1984
Chainage :Start 299.25 m
End 312.48 m
Advance for day 13.23 m

File Name: DY01-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	1.50	MINING		1.50	1,2,9-24	12-14000	-
1.50	2.20	RING INSTALLATION	168				
2.20	3.40	MINING		1.50	1,2,9-24	12-14000	-
3.40	4.15	RING INSTALLATION	169				
4.15	5.20	MINING		1.50	1,2,9-24	12-14000	-
5.20	5.47	RING INSTALLATION	170				
5.47	7.07	MINING		1.50	1,2,9-24	11-14000	-
7.07	7.25	RING INSTALLATION	171				
7.25	7.45	MINING		0.30	1,2,9-24	12500	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	15.23	MAINTENANCE		-	-	-	CHANGED CUTTERS #14,15,16,26,42A.
							INSTALL 2 LAGGING (RING #164)
							INSTALL 3 LAGGING (RING #165)
							INSTALL 3 LAGGING (RING #166)
							INSTALL 3 LAGGING (RING #167)
							INSTALL 5 LAGGING (RING #168)
							INSTALL 5 LAGGING (RING #169)
							INSTALL 5 LAGGING (RING #170)
							ASSORTED MACHINE MAINTENANCE
15.23	15.25	MINING		-	-	-	INCOMPLETE PUSH
15.25	15.28	DELAY					SECONDARY BELT CUT OUT
15.28	15.40	MINING		-	-	-	INCOMPLETE PUSH
15.40	15.43	DELAY					SECONDARY BELT CUT OUT
15.43	16.00	MINING		0.87	1-4,9-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.32	MINING		0.33	1-4,9-24	14000	COMPLETED PUSH
16.32	17.01	RING INSTALLATION	172				
17.01	17.12	MINING		-	-	-	INCOMPLETE PUSH
17.12	17.30	DELAY					POWER TROUBLE AT FACE
17.30	18.21	MAINTENANCE		-	-	-	CHANGED CUTTER #43A.
18.21	18.35	DELAY					CHANGE BOTTOM ROLLER (TOP OF STACKER)
18.35	20.00	MINING		1.51	1,2,9-24	14-15000	COMPLETED PUSH
20.00	20.21	RING INSTALLATION	173				
20.21	21.30	MINING		1.50	1,2,9-24	13-14000	-
21.30	21.53	RING INSTALLATION	174				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date JANUARY 24,1984
Chainage :Start 299.25 m
End 312.48 m
Advance for day 13.23 m

File Name: DY01-24A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
21.53	22.57	MINING		1.50	1,2,13-24	13.5-15000	-
22.57	23.19	RING INSTALLATION	175				
23.19	24.00	MINING		1.22	1,2,13-24	13-15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 25,1984
Chainage :Start 312.48 m
End 317.80 m
Advance for day 5.32 m

File Name: DY01-25A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.15	MINING		0.28	1-4,13-24	15000	COMPLETED PUSH
0.15	0.40	RING INSTALLATION	176				
0.40	1.45	MINING		1.52	1-4,13-24	15000	-
1.45	2.00	RING INSTALLATION	177				
2.00	3.05	MINING		1.52	1-4,13-24	15000	-
3.05	3.20	RING INSTALLATION	178				
3.20	4.05	MINING		-	-	-	INCOMPLETE PUSH
4.05	4.30	DELAY					SECONDARY BELT DOWN (WATER SEEPAGE)
4.30	4.50	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
4.50	5.05	RING INSTALLATION	179				
5.05	5.10	MINING		0.30	1-4,13-24	15000	INCOMPLETE PUSH
5.10	8.00	DELAY					REPAIR IDLER ROLLER ON STACKER
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #23,25,39. ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	23.35	MAINTENANCE		-	-	-	EXTEND BELT LINE,FLOOR SYSTEM & RAILS REPAIR TAIL PULLEY ON STACKER
23.35	24.00	MINING		0.30	1,2,9-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 26,1984 File Name: DY01-26A
Chainage :Start 317.80 m
End 327.80 m Project No: 831-6014
Advance for day 10.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.45	DELAY					NO.8 ELECTRIC DRIVE DOWN
0.45	1.30	MINING INTERMITTENTLY		-	-	-	INCOMPLETE PUSH(NO.8 MOTOR DOWN)
1.30	1.45	DELAY					REPAIR NO.8 MOTOR
1.45	4.45	DELAY					REPAIR IDLER ROLLER ON STACKER
4.45	5.13	MINING		1.00	1-4,13-24	15000	COMPLETED PUSH
5.13	5.25	RING INSTALLATION	180				
5.25	7.00	MINING		1.50	1-4,13-24	15000	NO.5 & 6 MOTORS DOWN
7.00	7.18	RING INSTALLATION	181				
7.18	8.00	MINING		0.60	1-4,13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHECK CUTTERS O.K. ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	16.43	MINING		0.90	1,2,11,13-24	12000	COMPLETED PUSH
16.43	16.57	RING INSTALLATION	182				
16.57	17.50	MINING		-	-	-	INCOMPLETE PUSH
17.50	18.26	DELAY					SECONDARY BELT LOCKED OUT
18.26	18.43	MINING		1.50	1,2,5,7,9,11, 13-24	12-15000	COMPLETED PUSH
18.43	18.57	RING INSTALLATION	183				
18.57	20.17	MINING		1.50	1,2,9-24	13-15000	-
20.17	20.40	RING INSTALLATION	184				
20.40	21.53	MINING		1.50	1,2,9-24	13-15000	-
21.53	22.09	RING INSTALLATION	185				
22.09	23.10	MINING		-	-	-	INCOMPLETE PUSH
23.10	23.26	DELAY					BROKEN SEQUENCE ROLLER CABLE
23.26	23.40	MINING		1.50	1,2,9-24	13-15000	COMPLETED PUSH
23.40	23.56	RING INSTALLATION	186				
23.56	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 27,1984
Chainage :Start 327.80 m
End 340.50 m
Advance for day 12.70 m

File Name: JY01-27A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.10	DELAY					SET UP TO CONTINUE MINING
0.10	0.45	MINING		-	-	-	INCOMPLETE PUSH
0.45	1.20	DELAY					NO POWER (CABLE CAUGHT IN SKID)
1.20	1.40	MINING		-	-	-	INCOMPLETE PUSH
1.40	1.45	DELAY					POWER OFF ON T.B.M.
1.45	2.00	MINING		1.53	1-4,9-24	15000	COMPLETED PUSH
2.00	2.13	RING INSTALLATION	187				
2.13	3.25	MINING		1.53	1-4,9-24	15000	-
3.25	3.45	RING INSTALLATION	188				
3.45	5.30	MINING		1.54	1-4,9-24	16000	-
5.30	5.45	RING INSTALLATION	189				
5.45	6.56	MINING		0.70	1-4,9-24	16000+	INCOMPLETE PUSH
6.56	8.00	MAINTENANCE		-	-	-	CHANGED GUAGE CUTTERS
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #26,29,38,40,41,43A. PINNED RING #187 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
16.00	16.25	-- SHIFT CHANGE------					
16.25	16.55	DELAY					
16.55	17.45	MINING		0.80	1,2,9-24	15000	COMPLETED PUSH(EXITING TIGHT AREA)
17.45	18.03	RING INSTALLATION	190				
18.03	19.13	MINING		1.50	1,2,9-24	15000	-
19.13	19.32	RING INSTALLATION	191				
19.32	20.30	MINING		1.50	1,2,9-24	13-14000	-
20.30	20.46	RING INSTALLATION	192				
20.46	22.01	MINING		1.50	1,2,13-24	14-15000	-
22.01	22.20	RING INSTALLATION	193				
22.20	23.18	MINING		1.50	1,2,9,11,13-24	13-14000	-
23.18	23.29	RING INSTALLATION	194				
23.29	24.00	MINING		0.60	1,2,9-24	13000+	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 28,1984
Chainage :Start 340.50 m
End 348.00 m
Advance for day 7.50 m

File Name: DY01-28A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.30	DELAY					STACKER PLUGGED WITH MUCK
0.30	1.15	MINING		0.90	1-4,13-24	15000	COMPLETED PUSH
1.15	1.27	RING INSTALLATION	195				
1.27	1.40	MINING		-	-	-	INCOMPLETE PUSH
1.40	1.56	DELAY					STACKER DOWN(BELT DRIVE SLIPPING)
1.56	2.50	MINING		1.50	1-4,13-24	14000	COMPLETED PUSH
2.50	3.05	RING INSTALLATION	196				
3.05	4.10	MINING		1.50	1-4,13-24	12000	-
4.10	4.25	RING INSTALLATION	197				
4.25	5.42	MINING		1.50	1-4,13-24	11000	-
5.42	5.57	RING INSTALLATION	198				
5.57	7.05	MINING		1.50	1-4,13-24	12000	-
7.05	7.18	RING INSTALLATION	199				
7.18	7.40	MINING		0.60	1-4,13-24	12000	INCOMPLETE PUSH
7.40	8.00	DELAY					CLEAN STACKER
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #20,22,24,31,36,37,42B.
							ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 30,1984
Chainage :Start 348.00 m
End 355.54 m
Advance for day 7.54 m

File Name: DY01-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #28,34,43A.
							ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	16.40	DELAY					WORK ON DISCHARGE LINE
16.40	17.00	DELAY					POWER OUT AT T.B.M. & STACKER
17.00	17.20	MINING		-	-	-	INCOMPLETE PUSH
17.20	17.35	DELAY					SECONDARY BELT SLIPPING
17.35	17.40	DELAY					WATER AT FACE(DRAINING DISCHARGE LINE)
17.40	18.12	MINING		0.90	1-4,13-24	12000	COMPLETED PUSH
18.12	18.25	RING INSTALLATION	200				
18.25	18.51	MINING		-	-	-	INCOMPLETE PUSH
18.51	19.06	DELAY					MAIN CONVEYOR DOWN
19.06	19.40	MINING		1.50	1-4,13-24	12000	COMPLETED PUSH
19.40	20.00	RING INSTALLATION	201				
20.00	20.56	MINING		1.50	1-4,13-24	15000	-
20.56	21.22	RING INSTALLATION	202				
21.22	22.12	MINING		1.50	1-4,13-24	15000	-
22.12	22.23	RING INSTALLATION	203				
22.23	23.15	MINING		1.50	1-4,13-24	15000	-
23.15	23.30	RING INSTALLATION	204				
23.30	23.50	MINING		0.60	1-4,13-24	15000	INCOMPLETE PUSH
23.50	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JANUARY 31,1984
Chainage :Start 355.54 m
End 367.09 m
Advance for day 11.55 m

File Name: DY01-31A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.49	MINING		0.90	1,2,9,11,13-24	13500	COMPLETED PUSH
0.49	1.07	RING INSTALLATION	205				
1.07	2.02	MINING		1.50	1,2,9,11,13-24	14-16000	-
2.02	2.20	RING INSTALLATION	206				
2.20	2.30	DELAY					
2.30	3.25	MINING		1.50	1,2,4,7,9,11, 13-24	13.5-16500	-
3.25	3.43	RING INSTALLATION	207				
3.43	4.39	MINING		1.50	1,2,9-24	13500	-
4.39	5.03	RING INSTALLATION	208				
5.03	6.01	MINING		1.50	1,2,9-24	13-15000	-
6.01	6.38	RING INSTALLATION	209				
6.38	7.28	MINING		1.50	1-4,9-24	15000	-
7.28	7.45	RING INSTALLATION	210				
7.45	8.00	-- SHIFT CHANGE------					
8.00	14.26	MAINTENANCE		-	-	-	CHANGED CUTTERS #21,35,39,42A,43A.
14.26	15.20	MINING		1.46	1,2,5-12	12500	INCOMPLETE PUSH
15.20	15.40	DELAY					SECONDARY CONVEYOR PLUGGED
15.40	16.00	-- SHIFT CHANGE------					
16.00	16.20	DELAY					WAIT FOR MATERIAL & DISCHARGE LINE WORK
16.20	16.25	MINING		0.04	1-4,13-24	12000	COMPLETED PUSH
16.25	16.50	DELAY					WAIT FOR MATERIALS
16.50	17.38	RING INSTALLATION	211	-	-	-	EAST CABLE PULLY DOWN
17.38	18.44	MINING		-	-	-	INCOMPLETE PUSH
18.44	19.08	DELAY					POWER OFF IN TUNNEL
19.08	19.11	MINING		1.50	1-4,13-24	12-15000	COMPLETED PUSH
19.11	19.28	RING INSTALLATION	212				
19.28	19.35	MINING		0.15	1-4,13-24	12-15000	INCOMPLETE PUSH
19.35	24.00	DELAY					PRIMARY CONVEYOR TORN(REPLACE)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 01,1984
Chainage :Start 367.09 m
End 378.93 m
Advance for day 11.84 m

File Name: DY02-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	7.25	DELAY		-	-	-	REPAIR PRIMARY BELT,EXTEND FLOORBEAMS AND RAILS,ALSO MUCKING
7.25	8.00	MINING		0.55	1-4,13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.15	MINING		-	-	-	INCOMPLETE PUSH
8.15	13.00	DELAY					INSTALL STACKER ON SURFACE
13.00	13.20	DELAY					T.B.M. DOWN (ELECTRICAL PROBLEMS)
13.20	13.46	MINING		0.79	1-4,13-24	15000	COMPLETED PUSH
13.46	14.02	RING INSTALLATION	213				
14.02	15.02	MINING		1.50	1-4,13-24	15000	-
15.02	15.26	RING INSTALLATION	214				
15.26	15.45	MINING		-	-	-	INCOMPLETE PUSH
15.45	15.49	DELAY					INSTALL THRUST BEAM
15.49	16.00	MINING		0.69	3,4,13-22	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.30	MINING		0.81	1-4,13-24	12000	COMPLETED PUSH
16.30	16.44	RING INSTALLATION	215				
16.44	17.17	MINING		-	-	-	INCOMPLETE PUSH
17.17	18.13	DELAY					STACKER DOWN (REMOVE)
18.13	18.20	MINING		-	-	-	INCOMPLETE PUSH
18.20	18.26	DELAY					NO POWER AT T.B.M.
18.26	18.37	MINING		1.50	1-4,13-24	11000	COMPLETED PUSH
18.37	18.50	RING INSTALLATION	216				
18.50	19.43	MINING		1.50	1-4,13-24	14000	-
19.43	19.58	RING INSTALLATION	217				
19.58	20.28	LUNCH					
20.28	21.26	MINING		1.50	1-4,13-24	12000	-
21.26	21.45	RING INSTALLATION	218				
21.45	21.50	DELAY					T.B.M. CUT OUT
21.50	22.43	MINING		1.50	1-4,9-24	12000	-
22.43	22.57	RING INSTALLATION	219				
22.57	23.50	MINING		1.50	1-4,9-24	12000	-
23.50	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 02,1984
Chainage :Start 378.93 m
End 394.53 m
Advance for day 15.60 m

File Name: DY02-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.35	RING INSTALLATION	220				
0.35	1.27	MINING		1.50	1,2,9-24	13.5-15000	-
1.27	1.41	RING INSTALLATION	221				
1.41	2.28	MINING		1.50	1,2,9-24	13.5-15000	-
2.28	2.49	RING INSTALLATION	222				
2.49	3.19	MINING		-	-	-	INCOMPLETE PUSH
3.19	3.30	DELAY					PUSH PUMP TROUBLE (NOT CUTTING IN)
3.30	4.00	MINING		1.50	1,2,5,7,9,11, 13-24	13-15000+	COMPLETED PUSH
4.00	4.16	RING INSTALLATION	223				
4.16	4.22	DELAY					BELTS LOCKED OUT
4.22	5.15	MINING		1.50	1,2,9-24	15000+	-
5.15	5.47	RING INSTALLATION	224				INSTALL MESH & EXPAND RING #223
5.47	6.46	MINING		1.50	1,2,9-24	15000	-
6.46	6.56	RING INSTALLATION	225				
6.56	7.08	MINING		0.43	1,2,9,11,13-24	15000	INCOMPLETE PUSH
7.08	7.45	DELAY		-	-	-	LOADER BROKE DOWN, "977" MOVED LOADER & CLEANED UP AREA. BELT WAS RUN OFF IN PROCESS.
7.45	8.00	-- SHIFT CHANGE------					
8.00	8.15	MINING		0.12	1,2,9,11,13-24	15000	INCOMPLETE PUSH
8.15	13.15	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,12,27,29,30,39,
13.15	16.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	17.35	DELAY					EXTEND MAIN CONVEYOR
17.35	18.10	MINING		0.95	1-4,13-24	14000	COMPLETED PUSH
18.10	18.21	RING INSTALLATION	226				
18.21	18.55	MINING		-	-	-	INCOMPLETE PUSH
18.55	19.05	DELAY					COFFEE BREAK
19.05	19.20	MINING		1.50	1-4,13-24	14000	COMPLETED PUSH
19.20	19.30	RING INSTALLATION	227				
19.30	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.50	MINING		1.50	1-4,13-24	14000	COMPLETED PUSH
20.50	21.00	RING INSTALLATION	228				
21.00	21.25	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 02,1984
Chainage :Start 378.93 m
End 394.53 m
Advance for day 15.60 m

File Name: DY02-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.25	21.37	DELAY					POWER OFF IN TUNNEL
21.37	21.57	MINING		-	-	-	INCOMPLETE PUSH
21.57	22.07	DELAY					COFFEE BREAK
22.07	22.15	MINING		1.50	1-4,9-24	14000	COMPLETED PUSH
22.15	22.25	RING INSTALLATION	229				
22.25	23.16	MINING		1.50	1-4,9-24	14000	-
23.16	23.27	RING INSTALLATION	230				
23.27	23.50	MINING		0.60	1-4,9-24	14000	INCOMPLETE PUSH
23.50	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 03,1984
Chainage :Start 394.53 m
End 412.73 m
Advance for day 18.20 m

File Name: DY02-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.45	MINING		0.90	1,2,9,11,13-24	13500+	COMPLETED PUSH
0.45	1.15	DELAY					EXTEND AIR LINE(NO AIR)
1.15	1.37	RING INSTALLATION	231				
1.37	2.29	MINING		1.50	1,2,5,7,11, 13-24	13500+	-
2.29	2.56	RING INSTALLATION	232				INSTALL MESH(RING #231)
2.56	3.23	MINING		-	-	-	INCOMPLETE PUSH
3.23	3.41	DELAY					CHUTE PLUGGED
3.41	4.04	MINING		1.50	1,2,9-11,13-24	15000	COMPLETED PUSH
4.04	4.18	RING INSTALLATION	233				
4.18	5.08	MINING		1.50	1-4,13-24	15000	-
5.08	5.25	DELAY					INSTALL MESH & EXPAND RING #232 & 233)
5.25	5.44	RING INSTALLATION	234				
5.44	6.18	MINING		-	-	-	INCOMPLETE PUSH
6.18	6.42	DELAY					CHUTE PLUGGED AT MAIN CONVEYOR
6.42	6.49	MINING		-	-	-	INCOMPLETE PUSH
6.49	6.57	DELAY					REMOVE RUBBER
6.57	7.04	MINING		1.50	1,2,9-24	13.5-15000	COMPLETED PUSH
7.04	7.18	RING INSTALLATION	235				
7.18	8.00	MINING		1.30	1,2,9-24	13.5-15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.20	MINING		0.25	1,2,9-24	13.5-15000	COMPLETED PUSH
8.20	8.34	RING INSTALLATION	236				
8.34	9.20	MINING		-	-	-	INCOMPLETE PUSH
9.20	9.26	DELAY					REMOVE MUCK AT MAIN BELT HEAD ROLLER
9.26	9.29	DELAY					SECONDARY BELT SLOW STARTING
9.29	9.44	MINING		1.50	3,4,13-24	16000	COMPLETED PUSH
9.44	10.00	RING INSTALLATION	237				
10.00	10.55	MINING		1.50	3,4,13-24	16000	-
10.55	11.05	RING INSTALLATION	238				
11.05	11.55	MINING		1.50	3,4,9-24	12500	-
11.55	12.00	DELAY					
12.00	12.14	RING INSTALLATION	239				
12.14	15.46	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,35,37,38,42A,43A. ASSORTED MACHINE MAINTENANCE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 03,1984
Chainage :Start 394.53 m
End 412.73 m
Advance for day 18.20 m

File Name: DY02-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
15.46	16.00	-- SHIFT CHANGE------					
16.00	17.01	DELAY					INSTALL TRACK
17.01	17.11	MINING		-	-	-	INCOMPLETE PUSH
17.11	17.30	DELAY					MUCK CHUTE PLUGGED
17.30	17.37	MINING		-	-	-	INCOMPLETE PUSH
17.37	17.51	DELAY					MUCK CHUTE PLUGGED
17.51	18.00	MINING		-	-	-	INCOMPLETE PUSH
18.00	18.10	DELAY					COFFEE BREAK
18.10	18.45	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
18.45	19.30	DELAY					WAIT FOR MATERIAL(TRACK INCOMPLETE)
19.30	20.00	RING INSTALLATION	240				
20.00	20.30	LUNCH					
20.30	21.23	MINING		1.50	1-4,13-24	14000	-
21.23	21.36	RING INSTALLATION	241				
21.36	22.23	MINING		-	-	-	INCOMPLETE PUSH
22.23	22.40	DELAY					T.B.M. POWER OFF
22.40	22.47	MINING		1.50	1-4,13-24	14000	COMPLETED PUSH
22.47	23.16	RING INSTALLATION	242				
23.16	23.50	MINING		0.75	1-4,13-24	14000	INCOMPLETE PUSH
23.50	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Karien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date FEBRUARY 04,1984 File Name: DY02-04A
Chainage :Start 412.73 m
End 416.94 m Project No: 831-6014
Advance for day 4.21 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.18	DELAY					NO POWER TO T.B.M.
0.18	0.36	MINING		-	-	-	INCOMPLETE PUSH
0.36	0.46	DELAY					PLUGGED CHUTE
0.46	0.53	MINING		-	-	-	INCOMPLETE PUSH
0.53	2.42	DELAY					BROKEN HYDRLC.HOSE ON T.B.M., DO NOT PROPER FITTING THEREFORE IMPROVISE.
2.42	3.10	MINING		0.75	1,2,9-24	13-15000	COMPLETED PUSH
3.10	3.23	RING INSTALLATION	243				
3.23	4.14	MINING		1.50	1,2,9-24	13-15000	-
4.14	4.29	RING INSTALLATION	244				
4.29	5.30	MINING		1.50	1,2,9,11,13-24	13-15000	-
5.30	5.57	RING INSTALLATION	245				INSTALL MESH & EXPAND RING #244
5.57	6.12	MINING		-	-	-	INCOMPLETE PUSH(DIRTY PILOT FILTER)
6.12	6.18	DELAY					DIRTY FILTER
6.18	6.29	MINING		-	-	-	INCOMPLETE PUSH
6.29	6.50	DELAY					CHUTE PLUGGED (CHANGE PILOT FILTER)
6.50	7.00	MINING		0.46	1,2,9-24	13-15000	COMPLETED PUSH
7.00	8.00	DELAY					CHUTE TROUBLE
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 06,1984
Chainage :Start 416.94 m
End 418.06 m
Advance for day 1.12 m

File Name: DY02-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	16.00	DELAY		-	-	-	WAIT FOR PILOT PUMP TO BE SHIPPED FROM TORONTO. INSTEAD LOVAT REP. WILL BE ON SITE TO RE-ROUTE OLD ONE.
							CHANGED CUTTER #32.
							ASSORTED MACHINE MAINTENANCE
16.00	17.57	DELAY		-	-	-	PLAN TO CHANGE CUTTERS,T.B.M. KEPT STALLING. START HEAD WITH PRESSURE ON RING
17.57	18.28	MINING		0.92	1,2,9-24	13-15000	COMPLETED PUSH
18.28	18.50	RING INSTALLATION	246				
18.50	19.30	DELAY		-	-	-	NO POWER IN TUNNEL,SEVERED FAN CABLE WHEN PULLING SKID
19.30	19.52	MINING		0.20	1,2,9,11,13-24	10000	INCOMPLETE PUSH
19.52	24.00	MAINTENANCE		-	-	-	PINNED RING #244
							RE-EXPANDED RING #244
							RE-ALIGNED RING #245
							CHANGED CUTTER #41.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 07,1984 File Name: DY02-07A
Chainage :Start 418.06 m
End 427.75 m Project No: 831-6014
Advance for day 9.69 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	1.50	DELAY		-	-	-	MAIN CONVEYOR DOWN,(PULLED CABLE OUT OF SEQUENCE ROLLER ON STACKER)
1.50	3.13	MINING		1.30	1-4,9-24	8000	COMPLETED PUSH
3.13	3.37	RING INSTALLATION	247				
3.37	3.40	MINING		-	-	-	INCOMPLETE PUSH
3.40	3.52	DELAY					TUNNEL POWER OFF(CABLE CAUGHT IN SKID)
3.52	4.33	MINING		-	-	-	INCOMPLETE PUSH
4.33	5.06	DELAY					SECURE RING #246(EAST SIDE POPPED OUT)
5.06	5.12	MINING		-	-	-	INCOMPLETE PUSH
5.12	6.45	DELAY					PIN RING #246 (TWISTED)
6.45	7.42	MINING		1.50	1-4,9-21	8000	COMPLETED PUSH
7.42	8.00	RING INSTALLATION	248				PARTIAL INSTALLATION
		-- SHIFT CHANGE------					
8.00	8.10	RING INSTALLATION	248				COMPLETE INSTALLATION
8.10	16.00	MAINTENANCE		-	-	-	INSTALL NEW PILOT PUMP
							PINNED RING #246 WITH 34 ROCKBOLTS
							ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	17.37	DELAY		-	-	-	RE-PLACED DUST SEAL INSIDE HEAD
17.37	18.15	DELAY		-	-	-	PINNED RING #245
							MUCK OUT RING #247
18.15	18.40	MINING		1.50	1,2,9-24	9.5-11000	-
18.40	19.32	RING INSTALLATION	249				EXPAND RING #247
19.32	20.38	MINING		1.50	1,2,9,11,13-24	12000	-
20.38	20.52	RING INSTALLATION	250				
20.52	21.50	MINING		1.50	1,2,9,11,13-24	11.5-13000	-
21.50	22.05	RING INSTALLATION	251				
22.05	23.05	MINING		1.50	1,2,9-24	12500	-
23.05	23.22	RING INSTALLATION	252				
23.22	23.54	MINING		0.89	1,2,9-24	12.5-13500	INCOMPLETE PUSH
23.54	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 08,1984
Chainage :Start 427.75 m
End 436.36 m
Advance for day 8.61 m

File Name: DY02-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.48	MINING		0.61	1-4,9-24	8000	COMPLETED PUSH
0.48	1.02	RING INSTALLATION	253				
1.02	2.00	MINING		1.50	1-4,9-24	13000	-
2.00	2.18	RING INSTALLATION	254				
2.18	2.22	MINING		-	-	-	INCOMPLETE PUSH
2.22	6.22	MAINTENANCE					PINNED RING #251 WITH 0.6m ROCKBOLTS
6.22	6.58	MINING		-	-	-	INCOMPLETE PUSH
6.58	7.10	DELAY					MAIN CONVEYOR DOWN(ROLLERS JAMBED)
7.10	7.50	MINING		1.00	1-4,9-24	8000	INCOMPLETE PUSH
7.50	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #36,39,42A,43A.
							PINNED RING #252 WITH
							23-1-1/2 INCH REBARS(WEST SIDE UPHILL)
							18-1-1/2 INCH REBARS(EAST SIDE UPHILL)
							6-1 INCH ROCKBOLTS
							ASSORTED MACHINE MAINTENANCE
16.00	17.14	DELAY		-	-	-	DEWATER FACE & HEAD OF T.B.M.
							POUR WALL FOR NEW SUMP
17.14	17.57	MINING		0.57	1-4,10,12, 13-24	9.5-13500	COMPLETED PUSH
17.57	18.53	RING INSTALLATION	255				ALSO WORK ON SKID BRACKETS
18.53	20.04	MINING		1.50	1-4,9-24	11.5-13500	-
20.04	20.33	RING INSTALLATION	256				
20.33	21.27	MINING		1.50	1,2,9-24	13-14000	-
21.27	21.46	RING INSTALLATION	257				
21.46	22.45	MINING		1.50	1-4,13-24	13-15000	-
22.45	23.04	RING INSTALLATION	258				TOO TIGHT FOR TOP STRUTS
23.04	23.16	MINING		-	-	-	INCOMPLETE PUSH
23.16	23.27	RING INSTALLATION	258				COMPLETE INSTALLATION
23.27	23.32	MINING		-	-	-	INCOMPLETE PUSH
23.32	23.36	DELAY					SHEARED 2 ROCKBOLTS ON RING #258
23.36	23.52	MINING		0.43	1-8,17-24	9.5-13500	INCOMPLETE PUSH
23.52	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 09,1984
Chainage :Start 436.36 m
End 446.35 m
Advance for day 9.99 m

File Name: DY02-09A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.30	DELAY		-	-	-	RE-PIN RING #246 (BACK)
0.30	1.45	MINING		1.07	1-4,9-24	12000	COMPLETED PUSH
1.45	2.02	RING INSTALLATION	259				
2.02	3.27	MINING		1.50	1-4,9-24	13000	-
3.27	3.40	RING INSTALLATION	260				
3.40	4.13	MINING		-	-	-	INCOMPLETE PUSH
4.13	4.42	LUNCH					
4.42	5.49	MINING		1.50	1-4,9-24	13000	COMPLETED PUSH
5.49	6.06	RING INSTALLATION	261				
6.06	7.23	MINING		1.50	1-4,9-24	13000	-
7.23	7.40	RING INSTALLATION	262				
7.40	7.45	MINING		0.15	1-4,9-24	13000	INCOMPLETE PUSH
7.45	7.50	-- SHIFT CHANGE------					
7.50	9.13	MINING		1.27	3,4,9-24	12500	COMPLETED PUSH
9.13	9.30	RING INSTALLATION	263				
9.30	10.35	MINING		-	-	-	INCOMPLETE PUSH
10.35	10.40	DELAY					SECONDARY CONVEYOR OFF
10.40	10.50	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
10.50	11.10	RING INSTALLATION	264				
11.10	12.00	MINING		-	-	-	INCOMPLETE PUSH
12.00	12.30	LUNCH					
12.30	13.15	MINING		1.50	3,4,9-21	12500	COMPLETED PUSH
13.15	13.30	RING INSTALLATION	265				
13.30	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #28,42A,43A.
							PINNED RING #263 WITH:
							21 1-1/2 INCH REBARS(WEST SIDE UPHILL)
							7 1-1/2 INCH REBARS(EAST SIDE UPHILL)
							9 1 INCH REBARS
							ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	24.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #6,13,14,17,18,21,22, 23,24,25.
							ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 10,1984
Chainage :Start 446.35 m
End 461.35 m
Advance for day 15.00 m

File Name: DY02-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	3.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #19,26,27.
3.00	4.05	MINING		1.50	1-4,9-24	14000	-
4.05	4.35	LUNCH					
4.35	5.10	RING INSTALLATION	266				
5.10	6.07	MINING		1.50	1-4,9-24	14000	-
6.07	6.25	RING INSTALLATION	267				
6.25	6.37	DELAY					PULL SKID AHEAD
6.37	7.36	MINING		1.50	1-24	12000	-
7.36	7.50	RING INSTALLATION	268				PARTIAL INSTALLATION
7.50	8.10	-- SHIFT CHANGE------					
8.10	8.30	RING INSTALLATION	268				COMPLETE INSTALLATION
8.30	8.37	DELAY					CLEAN MUCK IN HEAD TO PULL BACK
8.37	9.49	MINING		1.50	3,4,9-24	12500	-
9.49	10.05	RING INSTALLATION	269				
10.05	11.15	MINING		1.50	3,4,6,8-24	13000	-
11.15	11.24	DELAY					TRY TO FREE SCRAPER (JAMMED IN STEERING HEAD)
11.24	12.05	RING INSTALLATION	270				
12.05	12.35	LUNCH					
12.35	15.50	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS #31,42A,43A.
15.50	16.10	-- SHIFT CHANGE------					
16.10	17.15	DELAY					WORKED ON STACKER(DRIVE BELT)
17.15	18.16	MINING		1.50	1-4,11-24	12000	-
18.16	18.31	RING INSTALLATION	271				INSTALL MESH
18.31	19.35	MINING		1.50	1-4,11-24	12-13000	-
19.35	19.55	RING INSTALLATION	272				INSTALL MESH
19.55	20.52	MINING		1.50	1-4,11-24	12-13000	-
20.52	21.13	RING INSTALLATION	273				INSTALL MESH
21.13	22.23	MINING		1.50	1,2,13-24	14-14500	-
22.23	22.36	RING INSTALLATION	274				
22.36	23.35	MINING		1.50	1,2,6,8,13-24	12-14000	-
23.35	24.00	RING INSTALLATION	275				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 11,1984
Chainage :Start 461.35 m
End 468.35 m
Advance for day 7.00 m

File Name: DY02-11A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	1.10	DELAY					REMOVE STACKER FROM POSITION
1.10	2.07	MINING		1.50	1-4,13-24	14000	-
2.07	2.27	RING INSTALLATION	276				
2.27	3.30	MINING		1.50	1-4,13-24	14000	-
3.30	3.45	RING INSTALLATION	277				
3.45	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.30	MINING		1.50	1-4,13-24	14000	COMPLETED PUSH
5.30	5.51	RING INSTALLATION	278				
5.51	6.50	MINING		1.50	1-4,13-24	14000	-
6.50	7.05	RING INSTALLATION	279				
7.05	7.45	MINING		1.00	1-4,13-24	15000	-
7.45	8.00	-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 13,1984 — File Name: DY02-13A
Chainage :Start 468.01 m REVISED
End 470.37 m — Project No: 831-6014
Advance for day 2.36 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	9.15	DELAY		-	-	-	WATER IN PRESS.SWITCH BOX(ELECTRICAL)
9.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #30,32,33,40,42A,43A.
12.00	12.30	LUNCH					
12.30	13.10	MAINTENANCE		-	-	-	CONTINUE CUTTER CHANGE
13.10	13.30	DELAY					ELECTRICAL PROBLEMS
13.30	16.00	MAINTENANCE		-	-	-	END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #277 WITH:
							38 1-1/2 INCH REBARS
16.00	16.05	-- SHIFT CHANGE------					
16.05	16.20	DELAY					ADJUST MAIN CONVEYOR
16.20	16.35	DELAY					INSTALL SEQUENCE ROLLER ON STACKER
16.35	17.25	DELAY					NO POWER TO SECONDARY CONVEYOR
17.25	17.40	MINING		-	-	-	INCOMPLETE PUSH
17.40	18.55	DELAY					DEWATER FACE
18.55	19.40	MINING		0.66	1-4,13-24	15000	COMPLETED PUSH
19.40	19.57	RING INSTALLATION	280				
19.57	21.15	MINING		1.50	1-4,13-24	15000	-
21.15	21.35	RING INSTALLATION	281				VARIABLE LENGTH STRUTS USED
21.35	21.42	MINING		0.20	1-4,13-24	15000	INCOMPLETE PUSH
21.42	24.00	DELAY					T.B.M. KICKING OUT(WATER FROM ROOF)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 14,1984
Chainage :Start 470.37 m
End 484.36 m
Advance for day 13.99 m

File Name: DY02-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	1.10	MINING		1.30	1-4,13-24	15000	COMPLETED PUSH
1.10	1.28	RING INSTALLATION	282				
1.28	2.00	MINING		-	-	-	INCOMPLETE PUSH(SLOW PROGRESS)
2.00	6.25	DELAY					ELECTRICAL TROUBLE
6.25	7.16	MINING		1.50	1-4,13-24	13-15000	COMPLETED PUSH
7.16	7.29	RING INSTALLATION	283				
7.29	7.50	MINING		0.20	1-4,13-24	13-15000	INCOMPLETE PUSH
7.50	8.00	DELAY					PRESSURE PROBLEMS
		-- SHIFT CHANGE------					
8.00	8.15	DELAY		-	-	-	INSTALL POLYETHYLENE TO DIVERT WATER SEEPAGES FROM TUNNEL ROOF
8.15	9.28	MINING		1.24	3,4,13-24	14000	COMPLETED PUSH
9.28	9.44	RING INSTALLATION	284				
9.44	9.50	DELAY					ELECTRICAL PROBLEMS(WATER IN CIRCUITS)
9.50	11.03	MINING		1.50	3,4,13-24	14000	-
11.03	11.20	RING INSTALLATION	285				
11.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #29,35,37,38,42A,43A.
12.00	12.30	LUNCH					
12.30	15.45	MAINTENANCE		-	-	-	END CUTTER CHANGE ASSORTED MACHINE MAINTENANCE
15.45	16.00	-- SHIFT CHANGE------					
16.00	16.10	DELAY					REMOVE STACKER
16.10	17.15	MINING		1.50	1-4,13-24	16000	-
17.15	17.35	RING INSTALLATION	286				
17.35	18.28	MINING		1.50	1-4,13-24	16000	-
18.28	18.42	RING INSTALLATION	287				
18.42	19.40	MINING		1.50	1-4,13-24	10-15000	-
19.40	20.00	RING INSTALLATION	288				
20.00	20.30	LUNCH					
20.30	21.17	MINING		-	-	-	INCOMPLETE PUSH
21.17	21.30	DELAY					SECONDARY CONVEYOR DOWN(CHUTE PLUGGED)
21.30	21.47	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
21.47	22.03	RING INSTALLATION	289				
22.03	23.02	MINING		1.50	1-4,13-24	13000	-
23.02	23.22	RING INSTALLATION	290				

Notes:

Bonkin-Marien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 14,1984
Chainage :Start 470.37 m
End 484.36 m
Advance for day 13.99 m

File Name: DY02-14A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
23.22	23.45	MINING		0.75	1-4,13-24	13000	-
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 15,1984
Chainage :Start 484.36 m
End 500.10 m
Advance for day 15.74 m

File Name: DY02-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.35	DELAY					LOCATE & INSTALL HYDRLC. FITTING
0.35	1.02	MINING		0.75	1-4,10,12, 13-24	14000	COMPLETED PUSH
1.02	1.16	RING INSTALLATION	291				
1.16	2.07	MINING		1.50	1-4,9-24	14000	-
2.07	2.18	RING INSTALLATION	292				
2.18	3.11	MINING		1.50	1-4,9-24	12-14000	-
3.11	3.24	RING INSTALLATION	293				
3.24	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.00	MINING		1.50	1-4,9-24	14000	COMPLETED PUSH(ALSO MUCKING)
5.00	5.18	RING INSTALLATION	294				
5.18	5.23	MINING		-	-	-	INCOMPLETE PUSH
5.23	5.32	DELAY					CHUTE TROUBLE
5.32	6.26	MINING		1.50	1-4,9-24	12.5-14000	COMPLETED PUSH
6.26	6.39	RING INSTALLATION	295				
6.39	7.40	MINING		1.50	1-4,9-24	13500	-
7.40	7.55	RING INSTALLATION	296				
7.55	8.00	MINING		-	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.48	MINING		-	-	-	INCOMPLETE PUSH
8.48	9.05	DELAY					CHUTE PLUGGED
9.05	9.24	MINING		1.49	3,4,9-24	10000	COMPLETED PUSH
9.24	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #30,31,36,43A,?.
							PINNED RING #294 WITH:
							6 1-1/2 INCH REBARS(EAST SIDE UPPER)
							6 1-1/2 INCH REBARS(WEST SIDE UPPER)
12.00	12.30	LUNCH					
12.30	13.00	MAINTENANCE		-	-	-	END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
13.00	13.30	DELAY					HOOK UP 200m OF MAIN POWER CABLE
13.30	14.10	MAINTENANCE		-	-	-	CLEAN UP T.B.M.
14.10	14.30	RING INSTALLATION	297				
14.30	14.50	DELAY					INSTALL RING #298 ON TOP OF RING #297
14.50	14.55	MAINTENANCE		-	-	-	CLEAN UP T.B.M.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 15,1984 — File Name: DY02-15A
Chainage :Start 484.36 m
End 500.10 m — Project No: 831-6014
Advance for day 15.74 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
14.55	15.07	MINING		-	-	-	INCOMPLETE PUSH
15.07	15.12	DELAY					NO.3 & 4 MOTORS NOT WORKING (BUTTON PUSHED IN PARTIALLY)
15.12	15.25	MINING		-	-	-	INCOMPLETE PUSH
15.25	15.32	DELAY					T.B.M. MINING SLOW(INSPECT CUTTERHEAD)
15.32	15.35	DELAY					CHUTE PLUGGED
15.35	15.46	MINING		0.52	3,4,9-24	10000	INCOMPLETE PUSH
15.46	16.05	-- SHIFT CHANGE------					
16.05	16.48	MINING		0.98	1-4,10,12, 13-24	15000	COMPLETED PUSH
16.48	17.01	RING INSTALLATION	298				
17.01	18.00	MINING		1.50	1-4,10,12, 13-24	15000	-
18.00	18.16	RING INSTALLATION	299				
18.16	19.10	MINING		-	-	-	INCOMPLETE PUSH
19.10	19.25	DELAY					
19.25	19.32	MINING		1.50	1-4,10,12, 13-24	16000	COMPLETED PUSH
19.32	19.45	RING INSTALLATION	300				
19.45	20.05	MINING		-	-	-	INCOMPLETE PUSH
20.05	20.35	LUNCH					
20.35	21.15	MINING		1.50	1-4,10,12, 13-24	16000	COMPLETED PUSH
21.15	21.30	RING INSTALLATION	301				
21.30	24.00	DELAY					MAIN CONVEYOR DOWN(SHUT DOWN TO CHECK SPLICE, WOULDN'T RE-START
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 16,1984
Chainage :Start 500.10 m
End 509.10 m
Advance for day 9.00 m

File Name: DY02-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.38	DELAY					MAIN CONVEYOR TROUBLE (WOULDN'T START)
0.38	1.28	MINING		1.50	1-4,10,12, 13-24	14-15000	-
1.28	1.39	RING INSTALLATION	302				
1.39	2.00	MINING		0.48	1-4,10,12, 13-24	13-15000	INCOMPLETE PUSH
2.00	8.00	DELAY					MAIN CONVEYOR BELT BROKE
8.00	12.00	MAINTENANCE & DELAY		-	-	-	CHANGED CUTTERS #33,39,40,42A,43A. SPLICE PRIMARY CONVEYOR
12.00	12.30	LUNCH					
12.30	15.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
15.00	15.50	MINING		0.85	1-4,10,12, 13-24	13-15000	INCOMPLETE PUSH
15.50	16.08	-- SHIFT CHANGE------					
16.08	16.20	MINING		0.17	1-4,10,12, 13-24	15000	COMPLETED PUSH
16.20	18.05	DELAY					REPAIR RETRACTION CYLINDER
18.05	18.36	RING INSTALLATION	303				
18.36	19.35	MINING		1.50	1-4,10,12, 13-24	15000	-
19.35	19.55	RING INSTALLATION	304				
19.55	20.20	LUNCH					
20.20	21.18	MINING		1.50	1-4,10,12, 13-24	15000	-
21.18	21.32	RING INSTALLATION	305				
21.32	22.23	MINING		1.50	1-4,10,12, 13-24	15000	-
22.23	22.36	RING INSTALLATION	306				
22.36	23.30	MINING		1.50	1-4,10,12, 13-24	15000	-
23.30	23.45	RING INSTALLATION	307				
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 17,1984
Chainage :Start 509.10 m
End 528.54 m
Advance for day 19.44 m

File Name: DY02-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	1.06	MINING		1.50	1-4,9-24	13500	-
1.06	1.18	RING INSTALLATION	308				
1.18	2.17	MINING		1.50	1-4,9-24	13500	-
2.17	2.31	RING INSTALLATION	309				
2.31	3.27	MINING		1.50	1-4,9-24	13500	-
3.27	3.43	RING INSTALLATION	310				
3.43	4.14	LUNCH					
4.14	5.02	MINING		1.50	1-4,9-24	13500	-
5.02	5.15	RING INSTALLATION	311				
5.15	5.28	MINING		-	-	-	INCOMPLETE PUSH
5.28	5.39	DELAY					T.B.M. CUTTING OUT(NO.5 & 6 MOTORS OUT)
5.39	6.00	MINING		-	-	-	INCOMPLETE PUSH
6.00	6.05	DELAY					T.B.M. CUTTING OUT
6.05	6.35	MINING		1.50	1-4,9-24	13500	COMPLETED PUSH
6.35	6.48	RING INSTALLATION	312				
6.48	7.12	MINING		-	-	-	INCOMPLETE PUSH
7.12	7.37	DELAY					INSTALL ADDITIONAL MESH OVER BAD GROUND
7.37	7.50	MINING		0.89	1-4,9-24	13500	INCOMPLETE PUSH
7.50	8.00	-- SHIFT CHANGE------					
8.00	8.27	MINING		0.59	3,4,9-24	12000	COMPLETED PUSH
8.27	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #21,25,28,37,42A,43A.
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE		-	-	-	END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #311 WITH:
13.07	13.30	RING INSTALLATION	313				4 1-1/2 INCH REBAR(EAST SIDE UPPER)
							4 1-1/2 INCH REBAR(EAST SIDE LOWER)
							4 1-1/2 INCH REBAR(WEST SIDE UPPER)
							4 1-1/2 INCH REBAR(WEST SIDE LOWER)
14.00	14.52	DELAY		-	-	-	CHECKED T.B.M. DIRECTION (SURVEYORS)
14.52	15.05	DELAY					ALIGN PRIMARY CONVEYOR
15.05	15.27	MINING		1.46	3,4,13-24	14000	-
15.27	15.37	RING INSTALLATION	314				
15.37	15.48	MINING		0.48	3,4,13-24	14000	INCOMPLETE PUSH
15.48	16.10	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 17,1984
Chainage :Start 509.10 m
End 528.54 m
Advance for day 19.44 m

File Name: DY02-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.10	16.58	MINING		1.33	1-4,13-24	15000	COMPLETED PUSH
16.58	17.12	RING INSTALLATION	315				
17.12	18.02	MINING		1.50	1-4,13-24	15000	-
18.02	18.18	RING INSTALLATION	316				
18.18	19.09	MINING		1.50	1-4,13-24	15000	-
19.09	19.20	RING INSTALLATION	317				
19.20	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.46	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
20.46	20.57	RING INSTALLATION	318				
20.57	21.26	MINING		-	-	-	INCOMPLETE PUSH
21.26	21.30	DELAY					BELT TRIPPED OFF
21.30	21.53	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
21.53	22.10	RING INSTALLATION	319				
22.10	22.14	DELAY					CHANGE HYDRLC. HOSE
22.14	23.00	MINING		-	-	-	INCOMPLETE PUSH
23.00	23.20	DELAY					CHUTE PLUGGED
23.20	23.26	MINING		1.50	1-4,13-24	16000	COMPLETED PUSH
23.26	23.40	RING INSTALLATION	320				
23.40	24.00	-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 18,1984
Chainage :Start 528.54 m
End 537.54 m
Advance for day 9.00 m

File Name: DY02-1BA

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	1.10	MINING		1.50	1-4,9-24	13-15000	-
1.10	1.22	RING INSTALLATION	321				
1.22	2.30	MINING		1.50	1-4,9-24	13-15000	-
2.30	2.42	RING INSTALLATION	322				
2.42	3.39	MINING		1.50	1-4,9-24	13-15000	-
3.39	3.56	RING INSTALLATION	323				
3.56	4.25	LUNCH					
4.25	5.27	MINING		1.50	1-4,9-24	13-15000	-
5.27	5.37	RING INSTALLATION	324				
5.37	6.40	MINING		1.50	1-4,9-24	13-15000	-
6.40	6.55	RING INSTALLATION	325				
6.55	7.52	MINING		1.50	1-4,9-24	13-15000	-
7.52	8.00	-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 20,1984
Chainage :Start 537.43 m REVISED
End 546.43 m
Advance for day 9.00 m

File Name: DY02-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #27,30,35,38,39,42A,43A; PINNED RING #323 WITH: 28 1-1/2 INCH REBAR; ASSORTED MACHINE MAINTENANCE
16.00	16.05	-- SHIFT CHANGE--					
16.05	16.35	DELAY					CHECK T.B.M.
16.35	16.55	RING INSTALLATION	326				
16.55	17.08	MINING		-	-	-	INCOMPLETE PUSH
17.08	17.11	DELAY					POWER KICKED OUT
17.11	18.02	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
18.02	18.15	RING INSTALLATION	327				
18.15	19.03	MINING		1.50	3,4,9-24	12-13000	-
19.03	19.14	RING INSTALLATION	328				
19.14	20.04	MINING		1.50	3,4,9-24	13-14000	-
20.04	20.16	RING INSTALLATION	329				
20.16	20.45	LUNCH					
20.45	21.35	MINING		1.50	3,4,13-24	15000	-
21.35	21.45	RING INSTALLATION	330				
21.45	22.33	MINING		1.50	3,4,13-24	15000	-
22.33	22.47	RING INSTALLATION	331				
22.47	23.48	MINING		1.50	3,4,13-24	15000	-
23.48	24.00	-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 21,1984
Chainage :Start 546.43 m
End 563.55 m
Advance for day 17.12 m

File Name: DY02-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.25	RING INSTALLATION	332				
0.25	1.21	MINING		1.50	1-4,13-24	15000	-
1.21	1.35	RING INSTALLATION	333				
1.35	2.35	MINING		1.50	1-4,13-24	15000	-
2.35	3.01	RING INSTALLATION	334				
3.01	4.00	MINING		1.50	1-4,13-24	15000	-
4.00	4.20	RING INSTALLATION	335				
4.20	4.40	LUNCH					
4.40	5.38	MINING		1.50	1-4,13-24	15000	-
5.38	6.03	RING INSTALLATION	336				
6.03	6.57	MINING		1.50	1-4,13-24	15000	-
6.57	7.10	RING INSTALLATION	337				
7.10	7.45	MINING		0.75	1-4,13-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #24,25,26,37,41,43A. TRY TO CHANGE CUTTER #42A, JAMMED ASSORTED MACHINE MAINTENANCE
16.00	16.20	-- SHIFT CHANGE------					
16.20	16.55	MINING		0.75	3,4,6,8,10,12,13-24	13500	COMPLETED PUSH
16.55	17.07	RING INSTALLATION	338				
17.07	17.57	MINING		1.50	3,4,6,8,10,12,13-24	14000	-
17.57	18.12	RING INSTALLATION	339				
18.12	18.26	MINING		-	-	-	INCOMPLETE PUSH
18.26	18.34	DELAY					
18.34	19.14	MINING		1.50	3,4,6,8,10,12,13-24	13.5-14500	COMPLETED PUSH
19.14	19.25	RING INSTALLATION	340				
19.25	20.17	MINING		1.50	3,4,9-24	14000	-
20.17	20.48	LUNCH					
20.48	21.06	RING INSTALLATION	341				
21.06	21.57	MINING		1.50	1-24	14000	-
21.57	22.15	RING INSTALLATION	342				
22.15	22.26	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 21,1984
Chainage :Start 546.43 m
End 563.55 m
Advance for day 17.12 m

File Name: DY02-21A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
22.26	22.44	DELAY					INSTALL MESH OVER BAD AREA IN THE BACK
22.44	23.18	MINING		1.50	3,4,9-24	13.5-15000	COMPLETED PUSH
23.18	23.28	RING INSTALLATION	343				
23.28	23.50	MINING		0.62	3,4,9-24	15000	INCOMPLETE PUSH
23.50	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 22,1984
Chainage :Start 563.55 m
End 571.93 m
Advance for day 8.38 m

File Name: DY02-22A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.45	MINING		0.88	1-4,13-24	15000	COMPLETED PUSH
0.45	1.00	RING INSTALLATION	344				
1.00	3.45	DELAY					REPAIR HYDRLC. LINE ON T.B.M.
3.45	4.00	DELAY					INSTALL AIR LINE SO THAT WATER CAN BE PUMPED FROM THE FACE
4.00	4.52	MINING		-	-	-	INCOMPLETE PUSH
4.52	5.04	DELAY					INSTALL MESH UNDER "LOOSE" IN BACK
5.04	5.25	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
5.25	5.40	RING INSTALLATION	345				
5.40	6.36	MINING		1.50	1-4,13-24	15000	-
6.36	6.56	RING INSTALLATION	346				
6.56	7.45	MINING		1.30	1-4,13-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	15.45	MAINTENANCE		-	-	-	CHANGED CUTTERS #12,23,31,39,43A. TRY TO REMOVE CUTTER #42A ASSORTED MACHINE MAINTENANCE
14.45	16.00	-- SHIFT CHANGE------					
16.00	20.32	MAINTENANCE		-	-	-	END CUTTER CHANGE
20.32	20.41	MINING		0.20	1-4,13-24	13500	COMPLETED PUSH
20.41	20.53	RING INSTALLATION	347				
20.53	21.09	MINING		-	-	-	INCOMPLETE PUSH
21.09	21.38	DELAY					ADJUST LOOP TAKE UP(MAIN BELT SLACK)
21.38	22.19	MINING		1.50	3,4,10,12, 13-24	13-15000	COMPLETED PUSH
22.19	22.32	RING INSTALLATION	348				
22.32	22.57	MINING		-	-	-	INCOMPLETE PUSH
22.57	23.11	DELAY					LOADER "DOWN" ON SURFACE
23.11	23.37	MINING		1.50	3,4,10,12, 13-24	14-15000	COMPLETED PUSH
23.37	23.50	RING INSTALLATION	349				
23.50	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 23,1984
Chainage :Start 571.93 m
End 588.98 m
Advance for day 17.05 m

File Name: DY02-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	1.25	DELAY					RE-SPLICE SECONDARY CONVEYOR
1.25	1.40	MINING		-	-	-	INCOMPLETE PUSH
1.40	1.45	DELAY					SURFACE CHUTE PLUGGED
1.45	2.22	MINING		1.50	1-4,9-24	15000	COMPLETED PUSH
2.22	2.38	RING INSTALLATION	350				
2.38	3.32	MINING		1.50	1-4,9-24	15000	-
3.32	3.46	RING INSTALLATION	351				
3.46	4.07	MINING		-	-	-	INCOMPLETE PUSH
4.07	4.25	LUNCH					
4.25	5.01	MINING		1.50	1-4,9-24	15000	COMPLETED PUSH
5.01	5.15	RING INSTALLATION	352				
5.15	6.06	MINING		1.50	1-4,9-24	15000	-
6.06	6.19	RING INSTALLATION	353				
6.19	7.12	MINING		1.50	1-4,9-24	15000	-
7.12	7.24	RING INSTALLATION	354				
7.24	7.45	MINING		0.50	1-4,9-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,11,13,19,22,27,40, 42B,43A.
16.00	16.18	-- SHIFT CHANGE------					PINNED RING #352
16.18	17.05	MINING		1.00	3,4,9-24	15000	ASSORTED MACHINE MAINTENANCE
17.05	17.18	RING INSTALLATION	355				COMPLETED PUSH
17.18	18.16	MINING		1.50	3,4,10,12, 13-24	15000	-
18.16	18.30	RING INSTALLATION	356				
18.30	19.22	MINING		1.50	3,4,9-24	15000	-
19.22	19.36	RING INSTALLATION	357				
19.36	20.08	LUNCH					
20.08	21.02	MINING		1.50	3,4,9-24	15000	-
21.02	21.16	RING INSTALLATION	358				
21.16	22.06	MINING		1.50	3,4,13-24	15000	-
22.06	22.17	RING INSTALLATION	359				
22.17	23.12	MINING		1.50	3,4,13-24	15000	-
23.12	23.27	RING INSTALLATION	360				
23.27	23.51	MINING		0.55	3,4,13-24	15000	INCOMPLETE PUSH & SHIFT CHANGE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 24,1984
Chainage :Start 588.98 m
End 603.93 m
Advance for day 14.95 m

File Name: DY02-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.50	MINING		0.95	1-4,13-24	15000	COMPLETED PUSH
0.50	1.02	RING INSTALLATION	361				
1.02	1.50	MINING		1.50	1-4,13-24	15000	-
1.50	2.04	RING INSTALLATION	362				
2.04	2.54	MINING		1.50	1-4,13-24	15000	-
2.54	3.05	RING INSTALLATION	363				
3.05	3.30	MINING		-	-	-	INCOMPLETE PUSH
3.30	3.51	DELAY					PRIMARY CONVEYOR TRIPPED OFF
3.51	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.20	LUNCH					
4.20	4.40	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
4.40	4.52	RING INSTALLATION	364				
4.52	5.48	MINING		1.50	1-4,13-24	15000	-
5.48	5.59	RING INSTALLATION	365				
5.59	6.53	MINING		1.50	1-4,13-24	15000	-
6.53	7.14	RING INSTALLATION	366				
7.14	7.45	MINING		0.60	1-4,13-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #14,16,18,27,28,29,30, 36,37,39,42B,43A.
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.50	MAINTENANCE		-	-	-	END CUTTER CHANGE
15.50	16.16	-- SHIFT CHANGE------					
16.16	16.54	MINING		0.90	3-8,13-24	14500	COMPLETED PUSH
16.54	17.08	RING INSTALLATION	367				
17.08	17.37	MINING		-	-	-	INCOMPLETE PUSH
17.37	17.51	DELAY					SECONDARY BELT STOPPED FROM ABOVE
17.51	18.17	MINING		1.50	3,4,9-24	11.5-14000	COMPLETED PUSH
18.17	18.30	RING INSTALLATION	368				
18.30	19.23	MINING		1.50	3,4,9-24	11.5-14500	-
19.23	19.38	RING INSTALLATION	369				
19.38	20.09	LUNCH					
20.09	20.14	DELAY					TROUBLE RESTARTING SECONDARY BELT
20.14	20.28	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 24,1984
Chainage :Start 588.98 m
End 603.93 m
Advance for day 14.95 m

File Name: DY02-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.28	20.50	DELAY					ALIGN RING #368 & SECURE WITH PUSH RING
20.50	21.10	MINING		-	-	-	INCOMPLETE PUSH
21.10	22.08	DELAY					RE-ALIGN RING #368 AND PIN
22.08	22.34	MINING		1.50	3-8,13-24	10-14000	COMPLETED PUSH
22.34	22.56	RING INSTALLATION	370				
22.56	23.26	DELAY					RE-ALIGNED RING #369 AND PIN
23.26	23.56	MINING		0.50	3,4,9-24	10000	INCOMPLETE PUSH
23.56	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 25,1984
Chainage :Start 603.93 m
End 611.80 m
Advance for day 7.87 m

File Name: DY02-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.50	MINING		-	-	-	INCOMPLETE PUSH
0.50	1.26	DELAY					RE-ALIGN RING #269
1.26	1.36	MINING		1.00	1-4,9-24	12000	COMPLETED PUSH
1.36	1.58	RING INSTALLATION	371				
1.58	3.00	MINING		1.50	1-4,9-24	13000	-
3.00	3.15	RING INSTALLATION	372				
3.15	3.25	DELAY					PIN RING #370
3.25	3.50	MINING		-	-	-	INCOMPLETE PUSH
3.50	4.13	LUNCH					
4.13	4.40	MINING		1.50	1-4,9-24	15000	COMPLETED PUSH
4.40	4.52	RING INSTALLATION	373				
4.52	5.47	MINING		1.50	1-4,9-24	14000	-
5.47	5.59	RING INSTALLATION	374				
5.59	6.50	MINING		1.50	1-4,9-24	14000	-
6.50	7.03	RING INSTALLATION	375				
7.03	7.45	MINING		1.17	1-4,9-24	14000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 27,1984
Chainage :Start 611.80 m
End 617.59 m
Advance for day 5.79 m

File Name: DY02-27A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.05	-- SHIFT CHANGE------					
8.05	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #5,6,21,34,38,43A. PINNED RING #273 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
16.00	16.15	-- SHIFT CHANGE------					
16.15	17.30	MAINTENANCE & DELAY		-	-	-	END CUTTER CHANGE ASSORTED MACHINE MAINTENANCE WAIT FOR BOLTS(REPLACEMENT FOR BROKEN CENTRE CUTTER BOLTS)
17.30	18.40	DELAY		-	-	-	REPLACE 2 BROKEN BOLTS ON CENTRE CUTTER
18.40	19.50	MAINTENANCE		-	-	-	INSTALL NEW METAL GUARD ON THE CENTRE CUTTER C/W WATER SWIVEL HOUSING
19.50	20.12	MINING		0.33	3,4,11-24	10000	COMPLETED PUSH
20.12	20.22	RING INSTALLATION	376				
20.22	20.55	MINING		-	-	-	INCOMPLETE PUSH
20.55	20.57	DELAY					PRIMARY BELT ACCIDENTLY SHUT OFF
20.57	21.12	MINING		1.50	3,4,11-24	12500	COMPLETED PUSH
21.12	21.24	RING INSTALLATION	377				
21.24	22.11	MINING		1.50	3,4,11-24	12500	-
22.11	22.21	RING INSTALLATION	378				
22.21	23.07	MINING		1.50	3,4,13-24	12500	-
23.07	23.15	RING INSTALLATION	379				
23.15	23.45	MINING		0.90	3,4,13-24	12500	INCOMPLETE PUSH
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 28,1984
Chainage :Start 617.59 m
End 631.65 m
Advance for day 14.06 m

File Name: DY02-28A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.34	MINING		0.60	3,4,9-24	13000	COMPLETED PUSH
0.34	0.44	RING INSTALLATION	380				
0.44	1.41	MINING		1.50	3,4,13-24	12500	-
1.41	1.54	RING INSTALLATION	381				
1.54	2.43	MINING		1.50	3,4,5-9,10,12,13-24	13000	-
2.43	2.57	RING INSTALLATION	382				
2.57	3.58	MINING		1.50	3,4,5-9,10,12,13-24	12500	-
3.58	4.29	LUNCH					
4.29	4.44	RING INSTALLATION	383				
4.44	5.35	MINING		1.50	3,4,9-24	12-15000	-
5.35	5.51	RING INSTALLATION	384				
5.51	6.38	MINING		1.50	3-8,13-24	12-15000	-
6.38	6.55	RING INSTALLATION	385				
6.55	7.45	MINING		1.21	3,4,13-24	13-15000	INCOMPLETE PUSH
7.45	8.05	-- SHIFT CHANGE------					
8.05	14.35	MAINTENANCE		-	-	-	CHANGED CUTTERS #8,17,20,28,39,42,43. PINNED RING #383 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
14.35	14.55	DELAY					MAIN CONVEYOR DOWN(INSTALL PULL BOI)
14.55	14.58	MINING		-	-	-	INCOMPLETE PUSH
14.58	15.12	DELAY					MAIN CONVEYOR DOWN(SLIPPING)
15.12	15.23	MINING		0.27	1-4,13-24	12000	COMPLETED PUSH
15.23	15.35	RING INSTALLATION	386				TWO RING HOLES DO NOT LINE UP
15.35	15.45	MINING		0.15	1-4,13-24	12000	INCOMPLETE PUSH
15.45	16.05	-- SHIFT CHANGE------					
16.05	16.48	MINING		1.38	3,4,10-24	12500	COMPLETED PUSH
16.48	16.58	RING INSTALLATION	387				
16.58	17.42	MINING		1.50	3,4,10-24	12500	-
17.42	17.52	RING INSTALLATION	388				
17.52	18.02	MINING		-	-	-	INCOMPLETE PUSH
18.02	18.07	DELAY					MAIN BELT STOPPED ON SURFACE
18.07	18.40	MINING		-	-	-	INCOMPLETE PUSH
18.40	23.35	DELAY					REPLACE TORN BELT ON PRIMARY CONVEYOR
23.35	23.45	MINING		1.45	3,4,10-24	12500	INCOMPLETE PUSH & SHIFT CHANGE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 29,1984
Chainage :Start 631.65 m
End 649.26 m
Advance for day 17.61 m

File Name: DY02-29A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.13	-- SHIFT CHANGE------					
0.13	0.18	MINING		0.05	3,4,13-24	14000	COMPLETED PUSH
0.18	0.33	RING INSTALLATION	389				
0.33	1.34	MINING		1.50	3,4,13-24	14000	-
1.34	1.50	RING INSTALLATION	390				
1.50	2.42	MINING		1.50	3,4,13-24	14-15000	-
2.42	2.55	RING INSTALLATION	391				
2.55	2.58	MINING		-	-	-	INCOMPLETE PUSH
2.58	3.04	DELAY					WET MUCKING
3.04	3.56	MINING		1.50	3,4,13-24	13500	COMPLETED PUSH
3.56	4.18	RING INSTALLATION	392				TIGHT AT TOP OF RING
4.18	4.47	LUNCH					
4.47	5.48	MINING		1.50	3,4,13-24	13-15000	-
5.48	6.00	RING INSTALLATION	393				COULDN'T GET TOP STRUTS IN PLACE
6.00	6.10	MINING		-	-	-	INCOMPLETE PUSH
6.10	6.15	DELAY					INSTALL TOP STRUTS FROM RING #393
6.15	6.55	MINING		1.50	3,4,5-9,13-24	14500	COMPLETED PUSH
6.55	7.07	DELAY					INSTALL MESH & EXPAND RING #393
7.07	7.22	RING INSTALLATION	394				
7.22	7.42	MINING		-	-	-	INCOMPLETE PUSH
7.42	7.45	DELAY					PRIMARY CONVEYOR STOPPED
7.45	7.47	MINING		0.70	3-8,13-24	13-14000	INCOMPLETE PUSH
7.47	8.10	-- SHIFT CHANGE------					
8.10	8.20	DELAY					INSPECT PRIMARY CONVEYOR SPLICE
8.20	8.40	MINING		0.74	1-8,13-24	12000	COMPLETED PUSH
8.40	14.35	MAINTENANCE		-	-	-	CHANGED CUTTERS #15,25,26,39,40,42,43A.
							PINNED RING #392 WITH 4 SETS OF PINS
							RE-SPLICE PRIMARY BELT
14.35	15.05	RING INSTALLATION	395				
15.05	15.45	MINING		0.66	1-8,13-24	12000	INCOMPLETE PUSH(SLOW MINING)
15.45	16.05	-- SHIFT CHANGE------					
16.05	17.00	MINING		0.90	3,4,13-24	14000	COMPLETED PUSH
17.00	17.12	RING INSTALLATION	396				
17.12	17.22	MINING		-	-	-	INCOMPLETE PUSH
17.22	18.02	DELAY					RING #395 ROTATING
							PIN STRUTS E.& W.SIDE(RING #394-395)

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date FEBRUARY 29,1984
Chainage :Start 631.65 m
End 649.26 m
Advance for day 17.61 m

File Name: DY02-29A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.02	18.56	MINING		1.50	3,4,10-24	12000	COMPLETED PUSH
18.56	19.25	RING INSTALLATION	397				RE-ALIGN MESH OVER RING #395
19.25	20.05	MINING		-	-	-	INCOMPLETE PUSH
20.05	20.30	LUNCH					
20.30	20.50	MINING		1.40	3,4,13-24	12500	COMPLETED PUSH
20.50	21.03	RING INSTALLATION	398				
21.03	21.55	MINING		1.50	3,4,10-24	12500	-
21.55	22.06	RING INSTALLATION	399				
22.06	22.53	MINING		1.50	3,4,10-24	12500	-
22.53	23.04	RING INSTALLATION	400				
23.04	23.45	MINING		1.16	3,4,10-24	12500	INCOMPLETE PUSH
23.45	24.00	-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 01,1984
Chainage :Start 649.26 m
End 665.50 m
Advance for day 16.24 m

File Name: DY03-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	--SHIFT CHANGE-------					
0.18	0.33	MINING		0.34	3,4,9-24	12500	COMPLETED PUSH
0.33	0.50	RING INSTALLATION	401				
0.50	1.48	MINING		1.50	3,4,10-24	14000	POWER OFF 1.16-1.20
1.48	2.10	RING INSTALLATION	402				
2.10	3.04	MINING		1.50	3,4,10-24	10000-12500	ALL CYLINDERS IN LAST 15 MIN. OF PUSH
3.04	3.19	RING INSTALLATION	403				
3.19	4.14	MINING		1.50	3,4,13-24	13500	
4.14	4.29	RING INSTALLATION	404				
4.29	4.58	LUNCH					
4.58	6.18	MINING		1.50	3,4,9-24	14-15000	POWER CUT TO MACHINE BY T.B.M. LIGHTING CABLE SHORTING OUT (23 MIN.)
6.18	6.35	RING INSTALLATION	405				
6.35	7.28	MINING		1.50	1-24	13-15000	
7.28	7.46	RING INSTALLATION	406				
-	-	--SHIFT CHANGE---------					
8.10	8.30	CLEAN CUTTER HEAD					
8.30	15.45	CHANGE 12 CUTTERS					#43A,32,28,42,30,22,27,11,36,9,24,37
16.00	16.05	--SHIFT CHANGE---------					
16.05	16.30	-					
16.30	16.40	MINING		-	-	-	
16.40	16.45	POWER KICK OFF					
16.45	16.55	MINING		-	-	-	
16.55	17.10	SECURING RING #405					RING #405 ROTATING
17.10	17.35	MINING		-	-	-	
17.35	18.05	BELT STOPPAGE					ADJUSTED MAIN BELT
18.05	18.17	MINING		1.50	3,4,9-24	12000	
18.17	18.27	RING INSTALLATION	407				
18.27	18.47	SECURING RING #406					RING #406 ROTATING
18.47	19.40	MINING		1.50	3,4.9-24	12000	-
19.40	19.50	RING INSTALLATION	408				
19.50	21.05	MINING		1.50	3,4,9-24	12000	LUNCH 20.12-20.30
21.05	21.15	RING INSTALLATION	409				
21.15	22.10	MINING		1.50	3,4,9-24	12500	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 01,1984
Chainage :Start 649.26 m
End 665.50 m
Advance for day 16.24 m

File Name: DY03-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.10	22.20	RING INSTALLATION	410				
22.20	23.03	MINING		1.50	3,4,9-24	12500	-
23.03	23.12	RING INSTALLATION	411				
23.12	23.45	MINING		0.90	3,4,10-24	12500	INCOMPLETE PUSH
		--END OF SHIFT--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MARCH 02, 1984
Chainage: Start 665.50 m
End 682.60 m
Advance for day 17.10 m

File Name: DY03-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.12	SHIFT CHANGE					
0.12	0.37	MINING		.60	3,4,9-24	12000	COMPLETED PUSH
0.37	0.56	RING INSTALLATION	412				
0.56	1.48	MINING		1.50	3,4,9-24	12-14000	-
1.48	2.03	RING INSTALLATION	413				
2.03	2.56	MINING		1.50	3,4,9-24	12000	2.49-2.53 SECONDARY BELT STOPPED
2.56	3.09	RING INSTALLATION	414				
3.09	4.12	MINING		1.50	3,4,9-24	12-14000	3.11-3.20 SECONDARY BELT STOPPED
4.12	4.29	RING INSTALLATION	415				
4.29	4.57	LUNCH					
4.57	5.46	MINING		1.50	-	-	2-1 MIN. DELAYS (MACHINE STALLED)
5.46	6.03	RING INSTALLATION	416				
6.03	6.51	MINING		1.50	4,9,10,12,13-24	12500-14000	-
6.51	7.14	RING INSTALLATION	417				
7.14	7.18	DELAY		-	-	-	TROUBLE WITH IMPACTS TROUBLE WITH CONTACT SWITCH ON NO.5 & 6 MOTORS
7.18	7.46	MINING		0.97	3,4,10,12, 13-24		INCOMPLETED PUSH
		--SHIFT CHANGE--					
8.10	15.45	MAINTENANCE		-	-	-	CHANGE CUTTERS #28,29,42B,43A,?.
16.00	16.05	--SHIFT CHANGE--					
16.05	16.25	DELAY		-	-	-	ALIGNING MAIN BELT
16.25	16.49	MINING		0.53	3,4,10-24	12500	COMPLETED PUSH
16.49	17.00	RING INSTALLATION	418				
17.00	17.05	MINING		-			
17.05	18.10	DELAY		-	-	-	REPLACE RUPTURED HOSE NO. 1 MAIN DRIVE MOTOR
18.10	19.00	MINING		1.50	3,4,9-24	12500	-
19.00	19.10	RING INSTALLATION	419				
19.10	20.03	MINING		1.50	3,4,9-24	12500	-
20.03	20.15	RING INSTALLATION	420				
20.15	20.40	LUNCH					
20.40	21.30	MINING		1.50	3,4,9-24	12500	-
21.30	21.42	RING INSTALLATION	421				
21.42	22.30	MINING		1.50	3,4,9-24	12500	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 02, 1984
Chainage :Start 665.50 m
End 682.60 m
Advance for day 17.10 m

File Name: DY03-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.30	22.43	RING INSTALLATION	422				
22.43	23.30	MINING		1.50	3,4,10-24	-	-
23.30	23.45	RING INSTALLATION --SHIFT CHANGE--	423				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MARCH 03, 1984
Chainage: Start 682.60 m
End 690.69 m
Advance for day 8.09 m

File Name: DY03-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	--SHIFT CHANGE---------					
0.15	1.11	MINING		1.50	3,4,9-24	12500	-
1.11	1.26	RING INSTALLATION	424				
1.26	2.16	MINING		1.50	3,4,9-24	12500	ALL RAMS USED ON THE LAST 10 MIN OF PUSH
2.16	2.31	RING INSTALLATION	425				
2.31	4.09	MINING		1.50	3,4,9-24	12500	3.21-4.06 LOST POWER TO T.B.M.
4.09	4.25	RING INSTALLATION	426				
4.25	4.55	LUNCH					
4.55	6.00	MINING		1.50	3,4,9-24 LATER ALL	13000	NOT USING MOTORS # 7 & 8
6.00	6.15	RING INSTALLATION	427				
6.15	6.24	DELAY IN MINING		-	-	-	T.B.M. CONTINUOUSLY CUTTING OUT
6.24	7.15	MINING		1.50	3,4,9-24	14000	-
7.15	7.27	RING INSTALLATION	428				
7.27	7.45	MINING		0.59	3,4,9-24	13000	-
		--END OF SHIFT---------					
		SAT. NO FURTHER WORK					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 05,1984
Chainage :Start 690.71 m
End 700.46 m
Advance for day 9.75 m

File Name: DY03-05A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8:00	13.49	MAINTENANCE		-	-	-	CHANGED 5 CUTTERS
							PINNED RING #426 WITH 4 SETS OF PINS
13.49	14.32	MINING		0.91	3-8,13-24	12000	SECONDARY BELT SLIPPING 14.11-14.20
14.32	14.52	RING INSTALLATION	429				SPECIAL LENGHT STRUTS
14.52	15.47	MINING		1.44	3	12000	-
		-- SHIFT CHANGE------					
16.10	16.54	RING INSTALLATION	430				TROUBLE EXPANDING RING #428
16.54	17.53	MINING		1.50	1-8,13-24	12000	-
17.53	18.09	RING INSTALLATION	431				
18.09	19.10	MINING		1.50	1-8,13-24	12000	-
19.10	19.23	RING INSTALLATION	432				
19.23	20.05	MINING		-	-	-	INCOMPLETE PUSH
20.05	20.35	LUNCH					
20.35	21.05	DELAY		-	-	-	DE-WATER FACE
21.05	21.26	MINING		1.50	1-8,13-24	12000	COMPLETED PUSH
21.26	21.46	RING INSTALLATION	433				
21.46	22.43	MINING		1.50	1-8,13-24	14000	-
22.43	22.52	RING INSTALLATION	434				
22.52	23.45	MINING		1.40	1-8,13-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 06,1984
Chainage :Start 700.46 m
End 716.55 m
Advance for day 16.09 m

File Name: DY03-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.05	-- SHIFT CHANGE------					
0.05	0.20	INSTALLING MESH					
0.20	0.30	MINING		0.09	3,4,9-24	11000	COMPLETED PUSH
0.30	0.47	RING INSTALLATION	435				
0.47	1.55	MINING		1.50	3,4,9-24	12500	-
1.55	2.05	RING INSTALLATON	436				
2.05	3.24	MINING		1.50	3,4,9-24	15000	-
3.24	3.40	RING INSTALLATION	437				
3.40	4.10	LUNCH					
4.10	5.12	MINING		1.50	3,4,9-24	15000	-
5.12	5.25	RING INSTALLATION	438				
5.25	6.35	MINING		1.50	,3,4,13-24	15000	-
6.35	6.48	RING INSTALLATION	439				
6.48	7.45	MINING		1.40	3,4,13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43B,33,37,42A,19,35,38,34.
16.00	16.10	-- SHIFT CHANGE------					ASSORTED MACHINE MAINTENANCE
16.10	16.20	MINING		0.10	1-4,13-24	12000	COMPLETED PUSH
16.20	16.32	RING INSTALLATION	440				
16.32	17.27	MINING		1.50	1-4,13-24	12000	-
17.27	17.40	RING INSTALLATION	441				
17.40	18.35	MINING		1.50	1-4,13-24	12000	-
18.35	18.46	RING INSTALLATION	442				
18.46	19.42	MINING		1.50	1-4,13-24	12000	-
19.42	19.53	RING INSTALLATION	443				
19.53	20.15	MINING		-	-	-	INCOMPLETE SHIFT
20.15	20.45	LUNCH					
20.45	21.05	DELAY		-	-	-	POWER OUTAGE
21.05	21.52	MINING		1.50	1-4,13-24	12000	COMPLETED PUSH
21.52	22.02	RING INSTALLATION	444				
22.02	22.56	MINING		1.50	1-4,13-24	12000	-
22.56	23.08	RING INSTALLATION	445				
23.08	23.45	MINING		1.00	1-4,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 07,1984
Chainage :Start 716.55 m
End 731.95 m
Advance for day 15.40 m

File Name: DY03-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.44	MINING		0.50	3,4,9-24	13000	COMPLETED PUSH
0.44	0.58	RING INSTALLATION	446				
0.54	2.04	MINING		1.50	3,4,10-24	13000	-
2.04	2.15	RING INSTALLATION	447				
2.15	3.12	MINING		1.50	3,4,10-24	13500	-
3.12	3.24	RING INSTALLATION	448				
3.24	3.30	DELAY		-	-	-	MAIN BELT STOPPED
3.30	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.08	MINING		1.50	3,4,9-24	15000	COMPLETED PUSH
5.08	5.20	RING INSTALLATION	449				
5.20	6.20	MINING		1.50	3,4,10-24	15000	-
6.20	6.33	RING INSTALLATION	450				
6.33	7.45	MINING		1.50	3,4,10-24	15000	-
		-- SHIFT CHANGE------					
8.00	13.20	MAINTENANCE					CHANGED CUTTERS#43B,26,13,1B,42A,14,40 AND 37. PINNED RING #449 WITH 4 SETS OF PINS. ASSORTED MACHINE MAINTENANCE AND EXTENTIONS.
13.20	13.35	RING INSTALLATION	451				
13.35	14.01	DELAY		-	-	-	MAIN BELT RE-TENSIONED
14.01	15.14	MINING		1.50	3,4,10,12-24	13500-14500	-
15.14	15.24	RING INSTALLATION	452				
15.24	15.46	MINING		0.43	3,4,10,12-24	14000-15000	INCOMPLETE PUSH
		--SHIFT CHANGE---------					
16.12	16.54	MINING		1.07	1-8,13-24	12000	COMPLETED PUSH
16.54	17.05	RING INSTALLATION	453				
17.05	18.00	MINING		1.50	1-8,13-24	12000	-
18.00	18.11	RING INSTALLATION	454				
18.11	19.09	MINING		1.50	1-8,13-24	12000	-
19.09	22.45	MAINTENANCE		-	-	-	CHANGED CUTTERS #19,2B,1B,41
22.45	23.30	MINING		1.40	1-8,13-24	12000	INCOMPLETE PUSH
23.30	23.45	DELAY		-	-	-	SECONDARY BELT SLIPPING
		--SHIFT CHANGE---------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 08,1984
Chainage :Start 731.95 m
End 750.05 m
Advance for day 18.10 m

File Name: DY03-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.05	--SHIFT CHANGE--------					
0.05	0.30	DELAY		-	-	-	ADJUSTING SECONDARY BELT TENSION
0.30	0.40	MINING		0.10	3,4,13-24	12500	COMPLETED PUSH
0.40	0.55	RING INSTALLATION	456				
0.55	1.46	MINING		1.50	3,4,9-24	12500	-
1.46	1.58	RING INSTALLATION	457				
1.58	2.49	MINING		1.50	3,4,9-24	13000	-
2.49	3.02	RING INSTALLATION	458				
3.02	3.58	MINING		1.50	3,4,10-24	13000	-
3.58	4.30	LUNCH					
4.30	4.42	RING INSTALLATION	459				
4.42	5.34	MINING		1.50	3,4,9-24	13000	-
5.34	5.50	RING INSTALLATION	460				
5.50	6.44	MINING		1.50	3,4,10-24	13500	
6.44	6.57	RING INSTALLATON	461				
6.57	7.45	MINING		1.20	3,4,9-24	14000	INCOMPLETE PUSH
		--SHIFT CHANGE--------					
8.00	15.20	MAINTENANCE		-	-	-	CHANGED CUTTERS #43B,23,21,10,42A,30,36 ,27,16,25,17,31,20,39,12,29. PINNED RING #460 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE.
16.00	16.10	-- SHIFT CHANGE------					
16.10	16.25	MINING		0.30	1-4,11-24	12000	COMPLETED PUSH
16.25	16.37	RING INSTALLATON	462				
16.37	17.25	MINING		1.50	1-4,11-24	12000	-
17.25	17.40	RING INSTALLATION	463				
17.40	18.30	MINING		1.50	1-4,11-24	12000	-
18.30	18.44	RING INSTALLATION	464				
18.44	19.30	MINING		1.50	1-4,11-24	12000	-
19.30	19.45	RING INSTALLATION	465				
19.45	20.05	MINING		-	-	-	INCOMPLETE PUSH
20.05	20.35	LUNCH					
20.35	20.40	DELAY		-	-	-	REPAIR ROLLER ON SECONDARY CONVEYOR
20.40	21.13	MINING		1.50	1-4,11-24	11000	COMPLETED PUSH
21.13	21.29	RING INSTALLATION	466				
21.29	22.17	MINING		1.50	1-4,11-24	11000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 08,1984
Chainage :Start 731.95 m
End 750.05 m
Advance for day 18.10 m

File Name: DY03-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.17	22.35	RING INSTALLATION	467				
22.35	23.26	MINING		1.50	1-4,11-24	11000	-
23.26	23.45	RING INSTALLATION	468				
		--SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 09,1984
Chainage :Start 750.05 m
End 767.55 m
Advance for day 17.50 m

File Name: DY03-09A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
0.00	0.20	--SHIFT CHANGE---------					
0.20	1.10	MINING		1.50	3,4,13-24	14000	-
1.10	1.25	RING INSTALLATION	469				
1.25	2.13	MINING		1.50	3,4,13-24	14000	-
2.13	2.28	RING INSTALLATION	470				
2.28	3.30	MINING		1.50	3,4,13-24	13000	LOST POWER TO MAIN DRIVE MOTOR MANY TIMES DURING PUSH.
3.30	3.45	RING INSTALLATION	471				
3.45	4.15	LUNCH					
4.15	6.10	MINING INTERMITTENTLY		1.50	3,4,10-24	11000	LOSING POWER TO MAIN DRIVE MOTOR.
6.10	6.25	RING INSTALLATION	472				
6.25	7.45	MINING INTERMITTENTLY		0.80	3,4,10-24	10000	LOSING POWER TO MAIN DRIVE MOTOR.
		-- SHIFT CHANGE------					
8.00	12.00	MAINTENANCE					CHANGE CUTTERS #15,43A,42B,38,27,33. SERVICE MACHINE.
12.00	12.30	LUNCH					
12.30	13.03	MAINTENANCE					
13.03	13.09	MINING		-	-	-	WORKING ON DRIVE MOTOR ELECTRICS. INCOMPLETE PUSH
13.09	13.15	MINING INTERMITTENTLY		-	-	-	MACHINE CUTTING OUT FREQUENTLY. SHUT OFF NO. 3 & 4 MOTORS.
13.15	13.37	MINING		0.70	3,4,9-24	13000	SIX MOTORS ONLY (1,2,5,6,7,8) COMPLETED PUSH
13.37	13.52	RING INSTALLATION	473				
13.52	14.20	MINING		-	-	-	INCOMPLETE PUSH
14.20	14.40	DELAY					ELECTRICAL TROUBLE WITH SWITCH BOX ON T.B.M.
14.40	15.07	MINING		1.50	3,4,9-24	12000-13500	-
15.07	15.20	RING INSTALLATION	474				
15.20	15.25	MINING		-	-	-	INCOMPLETE PUSH
15.25	15.36	DELAY					POWER KICKED OFF ACCIDENTLY
15.36	15.43	MINING		0.25	3,4,9-24	10000-13000	INCOMPLETE PUSH
15.43	16.12	--SHIFT CHANGE---------					
16.12	16.54	MINING INTERMITTENTLY		-	-	-	INCOMPLETE PUSH
16.54	17.05	DELAY					REPAIR #8 SWASH.
17.05	17.31	MINING		1.25	1-4,11-24	10000	COMPLETED PUSH
17.31	17.42	RING INSTALLATION	475				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 09,1984
Chainage :Start 750.05 m
End 767.55 m
Advance for day 17.50 m

File Name: DY03-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.42	18.41	MINING		1.50	1-4,11-24	10000	-
18.41	19.00	RING INSTALLATION	476				
19.00	19.35	MINING		-	-	-	INCOMPLETE PUSH
19.35	19.40	DELAY		-	-	-	SECONDARY CONVEYOR SLIPPING
19.40	19.52	MINING		1.50	1-4,11-24	10000	COMPLETED PUSH
19.52	20.01	RING INSTALLATION	477				
20.01	20.15	MINING		-	-	-	INCOMPLETE PUSH
20.15	20.45	LUNCH					
20.45	21.03	DELAY		-	-	-	LOCATING LAZER BEAM
21.03	21.42	MINING		1.50	1-4,11-24	10000	-
21.42	21.55	RING INSTALLATION	478				
22.55	22.40	MINING		1.50	1-4,11-24	10000	-
22.40	22.55	RING INSTALLATION	479				
22.55	23.45	MINING INTERMITTENTLY --SHIFT CHANGE--		1.00	1-4,11-24	10000	T.B.M.CUTTING OUT FREQUENTLY.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT(Tunnel 8 2)

Date MARCH 10, 1984
Chainage :Start 767.55 m
End 767.55 m
Advance for day 0.00 m

File Name: DY03-10A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
0.00	8.00	MAINTENANCE		-	-	-	OPERATION KNOCKED OFF, SNOWSTORM

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 12,1984
Chainage :Start 767.55 m
End 778.05 m
Advance for day 10.50 m

File Name: DY03-12A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.00	8.10	-- SHIFT CHANGE------					
8.10	9.37	DELAY		-	-	-	DIFFICULTY IN STARTING T.B.M. IT HAD BEEN IDLE SINCE FRI. NIGHT.
9.37	9.56	MINING		0.50	3,4,9-24	12500	COMPLETED PUSH
9.56	10.07	RING INSTALLATION	480				
10.07	11.04	MINING		1.50	3,4,9-24	13500	-
11.04	16.00	MAINTENANCE					ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS #43A,26,34,22,35.
16.00	16.10	-- SHIFT CHANGE------					
16.10	16.20	MAINTENANCE					ADJUSTING MAIN BELT ROLLERS
16.20	16.35	RING INSTALLATION	481				
16.35	17.33	MINING		1.50	3,4,9-24	13000	-
17.33	17.48	RING INSTALLATION	482				
17.48	18.00	MAINTENANCE					ADJUSTING MAIN BELT TENSION
18.00	18.50	MINING		1.50	3,4,9-24	13000	-
18.50	19.05	RING INSTALLATION	483				
19.05	19.57	MINING		1.50	3,4,13-24	13000	-
19.57	20.15	RING INSTALLATION	484				
20.15	20.40	LUNCH					
20.40	21.33	MINING		1.50	3,4,9-24	13000	-
21.33	21.50	RING INSTALLATION	485				
21.50	22.40	MINING		1.50	3,4,9-24	13000	-
22.40	22.49	RING INSTALLATION	486				
22.49	23.20	MINING		-	-	-	INCOMPLETE PUSH
23.20	23.37	DELAY		-	-	-	ALL CONVEYORS STOPPED #930 LOADER BROKE DOWN.
23.37	23.45	MINING		1.00	3,4,9-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MARCH 13,1984
Chainage: Start 778.05 m
End 795.04 m
Advance for day 16.99 m

File Name: DY03-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.30	MINING		0.50	-	-	COMPLETED PUSH
0.30	0.45	RING INSTALLATION	487				
0.45	0.55	DELAY		-	-	-	MAIN CONVEYOR OFF.
0.55	5.05	MINING &	488	1.50	-	-	INSPECTOR OFF SICK
		RING INSTALLATIONS	489	1.50	-	-	INCOMPLETE DATA.
			490	1.50	-	-	
			491	1.50	-	-	
5.05	7.00	DELAY		-	-	-	RUPTURED HYDRAULIC HOSE ON MAIN MOTOR
							INCOMPLETE PUSH NO.3
7.00	7.45	MINING		1.50	-	-	COMPLETED PUSH
7.45	7.50	MAINTENANCE					PLACED LOADING TRIP ON SKID
7.50	8.00	-- SHIFT CHANGE------					
8.00	14.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							PINNED RING 490
							CHANGED CUTTERS #23,29,37,43A,27,42,30, 40,36,19.
14.00	14.15	RING INSTALLATION	492				
14.15	13.11	MINING		1.50	3,4,9-24	13500	-
15.11	15.27	RING INSTALLATION	493				
15.27	15.32	MINING		-	3,4,10,12-24	13500	INCOMPLETE PUSH
15.32	15.36	DELAY					T.B.M. CUT OUT.
15.36	15.44	MINING		0.28	3,4,10,12-24	13500	INCOMPLETE PUSH
15.44	16.10	-- SHIFT CHANGE------					
16.10	16.55	MINING		1.22	3,4,10-24	13000	COMPLETED PUSH
16.55	17.13	RING INSTALLATION	494				
17.13	18.10	MINING		1.50	3,4,10-24	13000	-
18.10	18.25	RING INSTALLATION	495				
18.25	19.25	MINING		1.50	3,4,10-24	13000	-
19.25	19.40	RING INSTALLATION	496				
19.40	20.10	LUNCH					
20.10	21.10	MINING		1.50	3,4,10-24	14000	-
21.10	22.25	RING INSTALLATION	497				ONE PIECE WAS 2.75" LONGER THAN NORMAL
		AND DELAY					THIS PIECE WAS REPLACED.
22.25	23.25	MINING		1.50	3,4,10-24	14000	-
23.25	23.45	RING INSTALLATION	498				END OF SHIFT

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 14,1984
Chainage :Start 795.04 m
End 811.01 m
Advance for day 15.97 m

File Name: DY03-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.20	MAINTENANCE					CHECKED T.B.M.(OIL LEAK)
0.20	1.15	MINING		1.45	3,4,10-24	13000	-
1.15	1.25	RING INSTALLATION	499				
1.25	1.35	MINING		-	-	-	INCOMPLETE PUSH
1.35	2.35	DELAY AND MAINTENANCE					TRIED TO STOP OIL LEAK IN DIVIDER BLOCK 1-2 MOTOR.
2.35	3.23	MINING		1.50	3,4,10-24	12000	COMPLETED PUSH
3.23	3.35	RING INSTALLATION	500				
3.35	4.35	MINING		1.50	3,4,10-24	12000	-
4.35	4.50	RING INSTALLATION	501				
4.50	5.45	MINING		1.50	3,4,10-24	14000	-
5.45	6.00	RING INSTALLATION	502				
6.00	6.55	MINING		1.50	3,4,10-24	14000	-
6.55	7.05	RING INSTALLATION	503				
7.05	7.45	MINING		0.85	3,4,9-24	13000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS #42B,11,28,39,38,43A,25 PINNED RING #501 WITH ,41. 4 SETS OF PINS DRILLING PROBE HOLE IN A.M. ENCOUNTERED GAS. AT 256'IN HOLE. STOPPED PRODUCTION
16.00	16.15	-- SHIFT CHANGE------					
16.15	16.55	MINING		0.65	3,4,9-24	14000	COMPLETED PUSH
16.55	17.10	RING INSTALLATION	504				
17.10	18.25	MINING		1.50	3,4,13-24	14000	-
18.25	18.40	RING INSTALLATION	505				
18.40	19.35	MINING		1.50	3,4,13-24	14000	-
19.35	19.50	RING INSTALLATION	506				
19.50	20.20	LUNCH					
20.20	21.27	MINING		1.44	3,4,9-24	13500	-
21.27	21.40	RING INSTALLATION	507				
21.40	22.45	MINING		1.50	3,4,9-24	14000	-
22.45	23.05	RING INSTALLATION	508				
23.05	23.45	MINING		1.08	3,4,9-24	15000	INCOMPLETE PUSH --SHIFT CHANGE--------

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MARCH 15,1984
Chainage: Start 811.01 m
End 829.65 m
Advance for day 18.64 m

File Name: DY03-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.14	-- SHIFT CHANGE------					
0.14	0.27	MINING		0.42	1-4,10-24	14000	COMPLETED PUSH
0.27	0.37	RING INSTALLATION	509				
0.37	1.15	MINING		-	-	-	INCOMPLETE PUSH
1.15	1.23	DELAY					INSTALL MESH ON PREVIOUS RING
1.23	1.33	MINING		1.50	1-4,10-24	13000	COMPLETED PUSH
1.33	1.45	RING INSTALLATION	510				
1.45	2.40	MINING		1.50	1-4,10-24	13000	-
2.40	3.01	RING INSTALLATION	511				
3.01	3.54	MINING		1.50	1-4,10-24	12000	-
3.54	4.08	DELAY					INSTALL MESH
4.08	4.30	LUNCH					
4.30	4.45	RING INSTALLATION	512				
4.45	5.34	MINING		1.50	1-4,10-24	12000	-
5.34	5.45	DELAY					INSTALL MESH
5.45	5.58	RING INSTALLATION	513				
5.58	6.59	MINING		1.50	1-4,10-24	12000	-
6.59	7.08	RING INSTALLATION	514				
7.08	7.45	MINING		1.30	1-4,10-24	13000	-
7.45	8.00	-- SHIFT CHANGE------					
8.00	13.41	MAINTENANCE					CHANGED CUTTERS 843A,21,32,42,24.
							ASSORTED MACHINE MAINTENANCE
							GENERAL TRACK ACTIVITIES.
13.41	13.50	MINING		-	-	-	INCOMPLETE PUSH
13.50	13.55	DELAY					INSTALL MESH
13.55	14.00	MINING		0.20	3,4,9-24	14000	COMPLETED PUSH
14.00	14.20	RING INSTALLATION	515				
14.20	15.23	MINING		1.50	3,4,10-24	15000	-
15.23	15.41	RING INSTALLATION	516				
15.41	16.15	-- SHIFT CHANGE------					
16.15	16.30	DELAY					CHECK T.B.M. DIRECTION (SURVEYORS)
16.30	17.20	MINING		1.50	3,4,10-24	15000	-
17.20	17.35	RING INSTALLATION	517				
17.35	17.55	DELAY					CHECKED T.B.M. DIRECTION (SURVEYORS)
17.55	18.55	MINING		1.50	3,4,13-24	15000	-
18.55	19.10	RING INSTALLATION	518				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MARCH 15,1984
Chainage: Start 811.01 m
End 829.65 m
Advance for day 18.64 m

File Name: DY03-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.10	19.17	DELAY					CHECKED T.B.M. DIRECTION (SURVEYORS)
19.17	20.10	MINING		1.50	3,4,10-24	15000	-
20.10	20.35	LUNCH					
20.35	20.50	RING INSTALLATION	519				
20.50	21.53	MINING		1.44	3,4,10-24	15000	-
21.53	22.07	RING INSTALLATION	520				
22.07	22.12	DELAY					CHECKED T.B.M. DIRECTION (SURVEYORS)
22.12	23.16	MINING		1.50	3,4,10-24	15000	-
23.16	23.32	RING INSTALLATION	521				
23.32	23.45	MINING		0.28	3,4,10-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 16,1984 File Name: DY03-16A
Chainage :Start 829.65 m
End 842.02 m Project No: 831-6014
Advance for day 12.37 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.12	-- SHIFT CHANGE------					
0.12	0.55	MINING		1.22	1-4,13-24	13000	COMPLETED PUSH
0.55	1.10	RING INSTALLATION	522				
1.10	2.00	MINING		1.50	1-4,13-24	13000	-
2.00	2.35	DELAY					REMOVING "LOOSE " FROM BEHIND RING.
2.35	2.46	RING INSTALLATION	523				
2.46	4.00	MINING		1.50	1-4,16-24	15000	-
4.00	4.20	RING INSTALLATION	524				
4.20	4.35	LUNCH					
4.35	5.38	MINING		1.50	1-4,13-24	13000	-
5.38	5.55	RING INSTALLATION	525				
5.55	7.27	MINING		1.50	1-4,13-24	15000	-
7.27	7.40	RING INSTALLATION	526				
7.40	7.45	MINING		0.10	1-4,13-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	14.25	MAINTENANCE					CHANGED CUTTERS 843A,13,18,10,42,30,35, ASSORTED MACHINE MAINTENANCE. 14,15.
14.25	14.50	MINING		-	-	-	INCOMPLETE PUSH
14.50	15.05	DELAY					SECONDARY CONVEYOR SLIPPING
15.05	15.43	MINING		1.05	3,4,9-24	15000	INCOMPLETE PUSH
15.43	16.15	-- SHIFT CHANGE------					
16.15	16.35	MINING		0.35	3,4,13-24	15000	COMPLETED PUSH
16.35	16.48	RING INSTALLATION	527				
16.48	18.06	MINING		1.50	3,4,13-24	15000	-
18.06	18.20	RING INSTALLATION	528				
18.20	18.30	DELAY		-	-	-	CHECKED T.B.M. DIRECTION (SURVEYORS)
18.30	19.35	MINING		1.45	13-24	15000	-
19.35	19.50	RING INSTALLATION	529				
19.50	20.20	LUNCH					
20.20	20.35	MINING		0.30	-	-	INCOMPLETE PUSH
20.35	23.20	DELAY					REPLACE TORN MINI-BELT
23.20	23.45	MINING		0.40	13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 17,1984
Chainage :Start 842.02 m
End 854.77 m
Advance for day 12.75 m

File Name: DY03-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.12	-- SHIFT CHANGE------					
0.12	0.45	MINING		0.80	1-4,14-24	13000	COMPLETED PUSH
0.45	0.55	RING INSTALLATION	530				
0.55	1.01	DELAY					CHECKED GRADE
1.01	1.39	MINING		-	-	-	INCOMPLETE PUSH
1.39	5.10	DELAY					RE-TIGHTEN CUTTER BLOCKS.
5.10	5.33	MINING		1.50	14-24	15000	COMPLETED PUSH
5.33	5.43	RING INSTALLATION	531				
5.43	5.55	DELAY					CHECKED GRADE
5.55	6.47	MINING		1.47	14-24	15000	-
6.47	7.06	RING INSTALLATION	532				
7.06	7.45	MINING		0.70	14-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	14.30	MAINTENANCE					CHANGED CUTTERS 88,16,31,34,26,43.
14.30	15.10	MINING		0.80	1-8,17-24	12000	COMPLETED PUSH
15.10	15.40	RING INSTALLATION	533				
15.40	15.45	MINING		0.01	1-8,17-24	12000	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.18	MINING		1.40	3,4,13-24	12000	COMPLETED PUSH
17.18	17.30	RING INSTALLATION	534				
17.30	18.40	MINING		1.50	3,4,13-24	12000	-
18.40	18.50	RING INSTALLATION	535				
18.50	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH & DELAY					RUPTURED HOSE ON 88 MOTOR REPAIRED FROM
20.30	20.55	DELAY					20.00 HRS.TO 20.55 HRS.
20.55	21.08	MINING		1.50	3,4,13-24	12500	COMPLETED PUSH
21.08	21.20	RING INSTALLATION	536				
21.20	22.30	MINING		1.50	3,4,13-24	12500	-
22.30	22.50	RING INSTALLATION	537				
22.50	23.45	MINING		1.45	3,4,13-24	12500	-
		-- SHIFT CHANGE------					

Notes:

Dontin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 20,1984
Chainage :Start 854.77 m
End 868.56 m
Advance for day 13.79 m

File Name: DY03-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.21	-- SHIFT CHANGE------					
0.21	0.38	RING INSTALLATION	538				
0.38	1.37	MINING		1.50	3,4,9-24	13000	-
1.37	1.51	RING INSTALLATION	539				
1.51	2.50	MINING		1.50	3,4,9-24	13500	-
2.50	3.05	RING INSTALLATION	540				
3.05	3.26	MINING		-	-	-	INCOMPLETE PUSH
3.26	3.30	DELAY					INSTALL MESH
3.30	4.01	MINING		1.50	3,4,9-24	13500	COMPLETED PUSH
4.01	4.14	RING INSTALLATION	541				
4.14	4.42	LUNCH					
4.42	5.41	MINING		1.50	3,4,13-24	13-14000	-
5.41	5.56	RING INSTALLATION	542				
5.56	6.09	MINING		-	-	-	INCOMPLETE PUSH
6.09	6.14	DELAY					LOST POWER-ACCIDENTLY
6.14	6.52	MINING		1.50	3,4,13-24	14000	COMPLETED PUSH
6.52	7.07	RING INSTALLATION	543				
7.07	7.36	MINING		0.98	3,4,9-20	14500	INCOMPLETE PUSH
7.36	7.42	DELAY					PRIMARY CONVEYOR STOPPED.
7.42	8.00	-- SHIFT CHANGE------					
8.00	15.45	MAINTENANCE					CHANGED CUTTERS #43,38,42,40,27,36, ASSORTED MACHINE MAINTENANCE 41,33 PINNED RING #541 WITH 4 SETS OF PINS
16.00	16.15	-- SHIFT CHANGE------					
16.15	16.36	MINING		0.52	3,4,9-24	12500	COMPLETED PUSH
16.36	16.48	RING INSTALLATION	544				
16.48	17.45	MINING		1.50	3,4,10-24	12500	-
17.45	18.00	RING INSTALLATION	545				
18.00	19.00	DELAY		-	-	-	CHECKED T.B.M. DIRECTION (SURVEYORS)
19.00	19.52	MINING		1.50	3,4,9-24	12500	-
19.52	20.10	RING INSTALLATION	546				
20.10	20.30	LUNCH					
20.30	21.25	MINING		1.50	3,4,10-24	12500	-
21.25	21.35	RING INSTALLATION	547				
21.35	22.40	DELAY		-	-	-	RE-SETTING #546 RING WHICH HAD BUCKLED.
22.40	23.15	MINING		0.29	3,4,9-24	12500	23.15-23.45--PINNED #546 RING -3 SETS

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 21,1984 — File Name: DY03-21A
Chainage :Start 868.56 m
End 885.57 m — Project No: 831-6014
Advance for day 17.01 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.34	DELAY		-	-	-	COMPLETE PINNING RING #546
0.34	1.29	MINING		1.21	3,4.5,13-24	11-13000	COMPLETED PUSH
1.29	1.44	RING INSTALLATION	548				
1.44	2.40	MINING		1.50	3,4.5,13-24	13000	-
2.40	2.52	RING INSTALLATION	549				
2.52	3.48	MINING		1.50	3,4.5,13-24	13-14500	-
3.48	4.03	RING INSTALLATION	550				
4.03	4.34	LUNCH					
4.34	5.35	MINING		1.50	3,4.5,13-24	13.5-14500	-
5.35	5.49	RING INSTALLATION	551				
5.49	6.32	MINING		-	-	-	INCOMPLETE PUSH
6.32	6.37	DELAY					T.B.M. CUT OUT(TROUBLE-NO.5 & 6 MOTORS)
6.37	6.43	MINING		-	-	-	INCOMPLETE PUSH
6.43	6.48	DELAY					T.B.M.CUT OUT
6.48	6.56	MINING		-	-	-	INCOMPLETE PUSH
6.56	6.58	DELAY					RESTART T.B.M.
6.58	7.02	MINING		1.50	3,4.5,13-24	13000	COMPLETED PUSH
7.02	7.15	RING INSTALLATION	552				
7.15	7.43	MINING		0.32	13-24	13000	INCOMPLETE PUSH(NO.5 & 6 MOTOR TROUBLE) TROUBLE WITH NO.1 & 2 MOTORS
7.43	8.00	-- SHIFT CHANGE------					
8.00	13.45	MAINTENANCE		-	-	-	CHANGED CUTTERS #9,12,17,20,22,27,29, 37,42,43. PINNED RING #550 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
13.45	14.25	DELAY		-	-	-	T.B.M. WONT START (ELECTRICAL)
14.25	15.27	MINING		1.18	1-4,11-24	14000	COMPLETED PUSH
15.27	15.45	RING INSTALLATION	553				
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.15	MINING		1.50	3,4,11-24	15000	-
17.15	17.30	RING INSTALLATION	554				
17.30	18.25	MINING		1.50	3,4,13-24	13000	-
18.25	18.35	RING INSTALLATION	555				
18.35	18.45	MINING		-	-	-	INCOMPLETE PUSH
18.45	19.10	DELAY					CHECKED T.B.M. DIRECTION (SURVEYORS)

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 21,1984
Chainage :Start 868.56 m
End 885.57 m
Advance for day 17.01 m

File Name: DY03-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.10	20.00	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
20.00	20.10	RING INSTALLATION	556				
20.10	20.40	LUNCH					
20.40	21.40	MINING		1.50	3,4,11-24	13000	-
21.40	21.50	RING INSTALLATION	557				
21.50	22.10	DELAY					CHECKED T.B.M. DIRECTION (SURVEYORS)
22.10	23.10	MINING		1.50	3,4,11-24	15000	-
23.10	23.20	RING INSTALLATION	558				
23.20	23.45	MINING		0.80	3,4,10-24	13000	INCOMPLETE PUSH
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Dontio-Norimo Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MARCH 22,1984
Chainage: Start 885.57 m
End 903.23 m
Advance for day 17.66 m

File Name: DY03-22A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.37	MINING		0.70	3,4,9-24	13-14000	COMPLETED PUSH
0.37	0.50	RING INSTALLATION	559				
0.50	1.40	MINING		1.50	3,4,9-24	13-14000	-
1.40	1.53	RING INSTALLATION	560				
1.53	2.12	MINING		-	-	-	INCOMPLETE PUSH
2.12	2.24	DELAY					CHECKED T.B.M. DIRECTION (SURVEYORS)
2.24	3.04	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
3.04	3.14	RING INSTALLATION	561				
3.14	4.03	MINING		1.49	3,4,9-24	14500	-
4.03	4.34	LUNCH					
4.34	4.48	RING INSTALLATION	562				
4.48	5.46	MINING		1.47	3,4,9-24	14000	-
5.46	6.03	RING INSTALLATION	563				
6.03	6.58	MINING		1.50	3,4,9-24	14-14500	-
6.58	7.11	RING INSTALLATION	564				
7.11	7.42	MINING		0.84	3,4,9-24	14500	INCOMPLETE PUSH
7.42	8.00	-- SHIFT CHANGE------					
8.00	13.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43,42,23,28, (11,19,(USED)) PINNED RING #562 WITH 4 SETS OF PINS
13.00	13.45	DELAY		-	-	-	WAITING FOR MAIN CONVEYOR TO START.
13.45	14.05	MINING		-	-	-	INCOMPLETE PUSH
14.05	15.05	DELAY					MAIN CONVEYOR DOWN
15.05	15.15	MINING		0.70	1-4,9-24	12000	COMPLETED PUSH
15.15	15.30	RING INSTALLATION	565				
15.30	15.45	MINING		0.20	1-4,13-24	12000	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.03	MINING		1.30	3,4,10-24	14000	COMPLETED PUSH
17.03	17.13	RING INSTALLATION	566				
17.13	18.08	MINING		1.50	3,4,10-24	14000	-
18.08	18.20	RING INSTALLATION	567				
18.20	19.12	MINING		1.50	3,4,10-24	15000	-
19.12	19.22	RING INSTALLATION	568				
19.22	19.30	DELAY		-	-	-	CHECKED T.B.M. DIRECTION (SURVEYORS)
19.30	20.00	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MARCH 22,1984
Chainage :Start 885.57 m
End 903.23 m
Advance for day 17.66 m

File Name: DY03-22A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.00	20.30	LUNCH					
20.30	20.35	DELAY					CHECKED T.B.M. DIRECTION (SURVEYORS)
20.35	21.07	MINING		1.50	3,4,10-24	15000	-
21.07	21.20	RING INSTALLATION	569				
21.20	22.15	MINING		1.50	3,4,10-24	15000	-
22.15	22.25	RING INSTALLATION	570				
22.25	22.43	DELAY					CHECK OIL LEAK(NO.4 PUSH CYLINDER)
22.43	23.35	MINING		1.50	2,3,10-24	15000	-
23.35	23.48	RING INSTALLATION	571				
23.48	24.00	-- SHIFT CHANGE -----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT(Tunnel # 2)

Date MARCH 23,1984
Chainage :Start 904.23 m
End 918.73 m
Advance for day 14.50 m

File Name: DY03-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	-- SHIFT CHANGE------					
0.18	1.14	MINING		1.50	3,4,13-24	15000	-
1.14	1.25	RING INSTALLATION	572				
1.25	1.37	DELAY		-	-	-	SURVEYORS
1.37	2.27	MINING		-	-	-	INCOMPLETE PUSH
2.27	2.36	DELAY					INSTALLED TOP MESH
2.36	2.55	MINING		1.50	3-8,13-24	14-15000	COMPLETED PUSH
2.55	3.07	RING INSTALLATION	573				
3.07	3.26	MINING		-	-	-	INCOMPLETE PUSH
3.26	3.30	DELAY					RING ROTATION, PLACE EXPANS. RING
3.30	3.55	MINING		-	-	-	INCOMPLETE PUSH
3.55	4.02	DELAY					INSTALLED TOP MESH
4.02	4.07	MINING		-	-	-	INCOMPLETE PUSH
4.07	4.38	LUNCH					
4.38	4.56	MINING		1.50	3,4,9-24	13-15000	COMPLETED PUSH
4.56	5.12	RING INSTALLATION	574				
5.12	6.23	MINING		1.50	3,4,9-24	15000	-
6.23	6.38	RING INSTALLATION	575				
6.38	7.43	MINING		1.40	3,4,9-24	15000	INCOMPLETE PUSH
7.43	8.00	-- SHIFT CHANGE------					
8.00	11.30	MAINTENANCE					CHANGED CUTTERS#43,13,21,42.
11.30	12.00	MAINTENANCE					ASSORTED MACHINE AND VENTILATION SYSTEM: MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.18	MAINTENANCE		-	-	-	ASSORTED MACHINE AND VENTILATION SYSTEM: MAINTENANCE
14.18	14.26	MINING		0.10	1-4,10-24	15000	COMPLETED PUSH
14.26	14.40	RING INSTALLATION	576				
14.40	15.42	MINING		0.50	1-24	15000	INCOMPLETE PUSH
15.42	16.15	-- SHIFT CHANGE------					
16.15	17.20	MINING		1.00	3,4,9-24	15000	COMPLETED PUSH
17.20	17.35	RING INSTALLATION	577				
17.35	18.20	MINING		-	-	-	-
18.20	19.20	MAINTENANCE					PUMP PRESSURE CHECK
19.20	19.50	MINING		1.50	3,4,9-24	15000	-
19.50	20.00	RING INSTALLATION	578				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT(Tunnel # 2)

Date MARCH 23,1984
Chainage :Start 904.23 m
End 918.73 m
Advance for day 14.50 m

File Name: DY03-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.00	20.15	LUNCH					
20.15	21.20	MINING		1.50	3,4,9-24	15000	-
21.20	21.30	RING INSTALLATION	579				
21.30	22.25	MINING		1.50	3,4,9-24	15000	-
22.25	22.35	RING INSTALLATION	580				
22.35	22.50	DELAY		-	-	-	CHECKED T.B.M. DIRECTION (SURVEYORS)
22.50	23.45	MINING		1.00	3,4,9-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT(Tunnel # 2)

Date MARCH 24,1984
Chainage :Start 918.73 m
End 925.00 m
Advance for day 6.35 m

File Name: DY03-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.17	-- SHIFT CHANGE------					
0.17	0.38	MINING		0.50	3,4,9-24	14500	COMPLETED PUSH
0.38	0.53	RING INSTALLATION	581				
0.53	1.49	MINING		1.50	3,4,9,11,13-24	15000	-
1.49	2.03	RING INSTALLATION	582				
2.03	2.16	DELAY					SURVEYORS CHECKING MACHINE
2.16	3.13	MINING		1.50	3,4,9-24	14-15000	-
3.13	3.29	RING INSTALLATION	583				
3.29	3.34	MINING		-	-	-	INCOMPLETE PUSH
3.34	3.50	DELAY					INSTALLED 3 STRUTS AT TOP, CHECK LINE AND GRADE
3.50	4.03	MINING		-	-	-	INCOMPLETE PUSH
4.03	4.35	LUNCH					
4.35	5.22	MINING		1.50	3-8,15-24	14000	COMPLETED PUSH
5.22	5.37	RING INSTALLATION	584				
5.37	5.46	DELAY					SURVEY WORK
5.46	6.52	MINING		1.49	3,4,9-24	14-15000	
6.52	7.45	MAINTENANCE					HOSE DOWN SKID, BLEW DOWN CUTTING HEAD WITH AIR HOSE AND PULLED HEAD BACK
7.45	8.00	-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT(Tunnel # 2)

Date APRIL 02,1984
Chainage :Start 925.08 m
End 927.44 m
Advance for day 2.36 m

File Name: DY04-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.00	20.10	MAINTENANCE					WORKING ON CENTER CUTTER, WATER SWIVEL AND PLATES
20.10	20.35	LUNCH					
20.35	20.53	RING INSTALLATION	585				
20.53	21.20	DELAY		-	-	-	DELAY ON NEW DRIVE AND SEQUENCE ROLLER* : DISCONNECTED
21.20	22.39	MINING		1.44	3,4,9-24	13-15000	
22.39	22.54	RING INSTALLATION	586				
22.54	23.06	DELAY					TROUBLE STARTING UP SECONDARY CONVEYOR
23.06	23.45	MINING		0.92	3,4,9-24	13-15000	INCOMPLETE PUSH
-	-	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT(Tunnel # 2)

Date APRIL 03,1984
Chainage :Start 927.44 m
End 936.46 m
Advance for day 9.02 m

File Name: DY04-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.17	-- SHIFT CHANGE------					
0.17	0.45	MINING		0.58	1-4,13-24	13000	COMPLETED PUSH
0.45	0.52	RING INSTALLATION	587				
0.52	1.50	MINING		1.50	1-4,13-24	15000	-
1.50	2.00	RING INSTALLATION	588				
2.00	3.45	MAINTENANCE					CUT CHUTE TO ALLOW FOR CLEARANCE OVER NEW BELTLINE
3.45	8.00	DELAY	-	-	-	-	NO WATER; PUMP FOR SURFACE WELL BURNT OUT AND HAD TO BE REPLACED
8.00	16.00	MAINTENANCE					CHANGED CUTTERS # 43A AND 38; REPLACED ONE FACE SCRAPER PAD; PINNED RING #586 WITH 4 SETS OF PINS CHANGED BAFFLES AND 3 WATER SPRAYERS IN SCRUBBER; CHECKED BELT SPLICES IN NO.1 AND NO.2 CONVEYORS; REMOVE AND REPLACE SURFACE WATER PUMP.
16.00	16.23	-- SHIFT CHANGE------	-	-	-	-	-
16.23	18.04	MINING		1.50	3,4,13-24	15000	-
18.04	18.19	RING INSTALLATION	589				
18.19	19.40	MINING		1.50	3,4,13-24	15000	-
19.40	19.56	RING INSTALLATION	590				
19.56	20.27	LUNCH					
20.27	21.41	MINING		1.50	3,4,13-24	13-15000	-
21.41	21.58	RING INSTALLATION	591				
21.58	22.53	MINING		1.50	3,4,13-24	13-15000	-
22.53	23.06	RING INSTALLATION	592				
23.06	23.45	MINING		0.94	3,4,13-24	15000	INCOMPLETE PUSH
-	-	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 04,1984
Chainage :Start 936.46 m
End 950.52 m
Advance for day 14.06 m

File Name: DY04-04A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	— SHIFT CHANGE------					
0.15	0.45	MINING		0.5&	1-4,13-24	15000	COMPLETED PUSH
0.45	0.55	RING INSTALLATION	593				
0.55	1.50	MINING		1.50	1-4,13-24	15000	-
1.50	2.00	RING INSTALLATION	594				
2.00	3.07	MINING		1.50	1-4,13-24	15000	-
3.07	3.15	RING INSTALLATION	595				
3.15	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.25	LUNCH					
4.25	4.46	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
4.46	4.56	RING INSTALLATION	596				
4.56	6.05	MINING		1.50	1-4,13-24	15000	-
6.05	6.15	RING INSTALLATION	597				
6.15	6.18	MINING		-	-	-	INCOMPLETE PUSH
6.18	6.24	DELAY					MUCK CHUTE PLUGGED
6.24	7.22	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
7.22	7.33	RING INSTALLATION	598				
7.33	7.45	MINING		0.20	1-4,13-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE					CHANGED CUTTERS 843A,428,30,33,29,37, 28,32.; PINNED RING 596 WITH 4 SETS OF PINS; ASSORTED MACHINE MAINTENANCE
16.00	16.15	-- SHIFT CHANGE------					
16.15	17.05	MINING		1.30	3,4,13-24	15000	COMPLETED PUSH
17.05	17.17	RING INSTALLATION	599				
17.17	18.25	MINING		-	-	-	INCOMPLETE PUSH
18.25	18.35	DELAY					CHUTE PLUGGED
18.35	18.38	MINING		1.50	3,4,10,12, 17-24	15000	COMPLETED PUSH
18.38	18.53	RING INSTALLATION	600				
18.53	18.57	MINING		-	-	-	INCOMPLETE PUSH
18.57	21.40	MAINTENANCE					CHANGED CUTTERS 820,40,8,36.
21.40	22.30	MINING		1.50	3,4,10,12, 13-24	15000	COMPLETED PUSH
22.30	22.41	RING INSTALLATION	601				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date APRIL 04,1984
Chainage :Start 936.46 m
End 950.52 m
Advance for day 14.06 m

File Name: DY04-04A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
22.41	23.38	MINING		1.50	3,4,10,12, 13-24	15000	-
23.38	23.48	RING INSTALLATION -- SHIFT CHANGE	602				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: APRIL 05,1984
Chainage: Start 950.52 m
End 966.94 m
Advance for day 16.42 m

File Name: DY04-05A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE--					
0.15	1.10	MINING		1.50	1-4,13-24	13000	-
1.10	1.20	RING INSTALLATION	603				
1.20	2.13	MINING		1.50	1-4,13-24	13000	-
2.13	2.22	RING INSTALLATION	604				
2.22	3.20	MINING		1.50	1-4,13-24	13000	-
3.20	3.30	RING INSTALLATION	605				
3.30	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.26	LUNCH					
4.26	5.00	MINING		1.50	1-4,13-24	13000	COMPLETED PUSH
5.00	5.15	RING INSTALLATION	606				
5.15	6.25	MINING		1.42	1-4,13-24	13000	-
6.25	6.52	RING INSTALLATION	607				
6.52	7.45	MINING		0.90	1-4,13-24	13000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE--					
8.00	16.00	MAINTENANCE					CHANGED CUTTERS #43A,39,34,42B,27,41,35; PINNED RING #605 WITH 4 SETS OF PINS
16.00	16.14	-- SHIFT CHANGE--					
16.14	16.43	MINING		0.60	3,4,10,12, 13-24	15000	COMPLETED PUSH
16.43	16.58	RING INSTALLATION	608				
16.58	18.19	MINING		1.50	3,4,9-24	15000	-
18.19	18.34	RING INSTALLATION	609				
18.34	19.38	MINING		1.50	3,4,9,11, 13-24	15000	-
19.38	19.50	RING INSTALLATION	610				
19.50	20.20	LUNCH					
20.20	21.18	MINING		1.50	3,4,9,11, 13-24	15000	-
21.18	21.29	RING INSTALLATION	611				
21.29	22.30	MINING		1.50	3,4,9-24	15000	-
22.30	22.44	RING INSTALLATION	612				
22.44	23.34	MINING		1.50	3,4,9,11, 13-24	15000	-
23.34	23.46	RING INSTALLATION	613				
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 06,1984
Chainage :Start 966.94 m
End 982.99 m
Advance for day 16.05 m

File Name: DY04-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.16	MINING		1.50	1-4,10-24	13000	-
1.16	1.26	RING INSTALLATION	614				
1.26	2.27	MINING		1.50	1-4,10-24	13000	-
2.27	2.35	RING INSTALLATION	615				
2.35	3.15	MINING		-	-	-	INCOMPLETE PUSH
3.15	3.21	DELAY					MOTORS NO. 5 AND 6 NOT CUTTING IN
3.21	3.45	MINING		1.50	1-4,10-24	13000	COMPLETED PUSH
3.45	3.52	RING INSTALLATION	616				
3.52	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.27	LUNCH					
4.27	5.27	MINING		1.50	1-4,10,24	13000	COMPLETED PUSH
5.27	5.40	RING INSTALLATION	617				
5.40	6.50	MINING		1.50	1-4,10-24	14000	-
6.50	7.00	RING INSTALLATION	618				
7.00	7.45	MINING		1.10	1-4,10-24	14000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE					CHANGED CUTTERS #42A,32,43B,31,38,26. PINNED RING #617 WITH 4 SETS OF PINS
16.00	16.17	-- SHIFT CHANGE------					
16.17	16.32	MINING		0.40	3,4,9-24	15000	COMPLETED PUSH
16.32	16.55	RING INSTALLATION	619				
16.55	18.01	MINING		1.50	3,4,9,11, 13-24	15000	-
18.01	18.30	DELAY					NO PWR IN TUNNEL,(LIGHTING TRANSFORMER TRIPPED OFF)
18.30	18.44	RING INSTALLATION	620				
18.44	19.43	MINING		1.50	3,4,9-24	15000	-
19.43	19.58	RING INSTALLATION	621				
19.58	20.27	LUNCH					
20.27	21.33	MINING		1.50	10,12,13-24	15000	-
21.33	21.48	RING INSTALLATION	622				
21.48	22.47	MINING		1.50	10,12,13-24	15000	-
22.47	22.59	RING INSTALLATION	623				
22.59	23.44	MINING		1.05	10,12,13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 07,1984
Chainage :Start 982.99 m
End 989.44 m
Advance for day 6.45 m

File Name: DY04-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.45	MINING		0.45	12-24	15000	COMPLETED PUSH
0.45	1.00	RING INSTALLATION	624				
1.00	2.10	MINING		1.50	12-24	15000	-
2.10	2.28	RING INSTALLATION	625				
2.28	3.37	MINING		1.50	12-24	15000	-
3.37	3.46	RING INSTALLATION	626				
3.46	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.37	LUNCH					
4.37	5.20	MINING		1.50	12-24	15000	COMPLETED PUSH
5.20	5.35	RING INSTALLATION	627				
5.35	6.45	MINING		1.50	12-24	15000	-
6.45	7.45	RING INSTALLATION	628				
		-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 9 2)

Date APRIL 09,1984
Chainage :Start 989.44 m
End 996.22 m
Advance for day 6.78 m

File Name: BY04-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	15.45	MAINTENANCE					CHANGED CUTTERS #14,16,17,19,23,36,42, 43.
							PINNED RING 962#.
							REPLACE MUCK CHUTE ON SECONDARY BELT
15.45	16.10	-- SHIFT CHANGE------					
16.10	16.48	DELAY					WIRING SENSORS(GOLDER)
16.48	18.00	MINING		1.50	3,4,12-24	13000	-
18.00	18.28	RING INSTALLATION	629				
18.28	19.40	MINING		1.50	3,4,12-24	13000	-
19.40	19.50	RING INSTALLATION	630				
19.50	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.30	LUNCH					
20.30	21.30	MINING		1.50	3-8,12-24	13000	COMPLETED PUSH
21.30	21.37	DELAY					STRESS MEASUREMENT TEST(GOLDER)
21.37	21.45	RING INSTALLATION	631				
21.45	22.47	MINING		1.50	3,4,12-24	13000	-
22.47	22.55	DELAY					STRESS MEASUREMENT TEST(GOLDER)
22.55	23.05	RING INSTALLATION	632				
23.05	23.45	MINING		0.50	3,4,12-24	13000	INCOMPLETE PUSH
-	-	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: APRIL 10,1984
Chainage :Start 996.20 m
End 1012.88 m
Advance for day 16.68 m

File Name: DY04-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	0.54	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
0.54	1.08	RING INSTALLATION	633				
1.08	1.58	MINING		1.50	3,4,9-24	14000	-
1.58	2.09	RING INSTALLATION	634				
2.09	3.00	MINING		1.50	3,4,13-24	15000	-
3.00	3.12	RING INSTALLATION	635				
3.12	4.11	MINING		1.50	3,4,13-24	15000	-
4.11	4.42	LUNCH					
4.42	4.58	RING INSTALLATION	636				
4.58	6.03	MINING		1.50	3,4,13-24	15000	-
6.03	6.18	RING INSTALLATION	637				
6.18	7.02	MINING		-	-	-	INCOMPLETE PUSH
7.02	7.06	DELAY					T.B.M. KICKED OFF
7.06	7.23	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
7.23	7.37	RING INSTALLATION	638				
7.37	7.41	MINING		0.50	-	-	INCOMPLETE PUSH
7.41	8.00	-- SHIFT CHANGE------					
8.00	15.45	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,12,21,22,24,25,29, 30,33,38,39,40,43.
							PINNED RING #636
							RESPLICE SECONDARY CONVEYOR BELT
							ASSORTED MACHINE MAINTENANCE
15.45	16.10	-- SHIFT CHANGE------					
16.10	16.25	MAINTENANCE		-	-	-	CUTTER CHANGE TOOL CLEANUP
16.25	17.20	MINING		1.45	3,4,10-24	13000	COMPLETED PUSH
17.20	17.27	DELAY					STRESS MEASUREMENT TEST (GOLDERS)
17.27	17.35	RING INSTALLATION	639				
17.35	18.30	MINING		1.50	3,4,10-24	13000	-
18.30	18.40	RING INSTALLATION	640				
18.40	19.35	MINING		1.50	3,4,10-24	13000	-
19.35	19.45	RING INSTALLATION	641				
19.45	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.20	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
21.20	21.30	RING INSTALLATION	642				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 10,1984
Chainage :Start 996.20 m
End 1012.88 m
Advance for day 16.68 m

File Name: DY04-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.20	22.25	MINING		1.46	3,4,11-24	13000	-
22.25	22.35	RING INSTALLATION	643				
22.35	22.55	MINING		0.72	3,4,11-24	13000	INCOMPLETE PUSH
22.55	23.10	MINING INTERMITTENTLY					POWER TROUBLE
23.10	23.20	MINING		-	-	-	INCOMPLETE PUSH
23.20	23.45	MINING INTERMITTENTLY					POWER TROUBLE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 11,1984 File Name: DY04-11A
Chainage :Start 1012.88 m
End 1027.90 m Project No: 831-6014
Advance for day 15.02 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	0.27	MINING		-	-	-	INCOMPLETE PUSH
0.27	0.32	DELAY					MACHINE TRIPPED OFF
0.32	0.52	MINING		0.77	3,4,5-8,13-24	13500	COMPLETED PUSH
0.52	1.04	RING INSTALLATION	644				
1.04	1.58	MINING		1.50	3,4,5-8,13-24	13500	-
1.58	2.09	RING INSTALLATION	645				
2.09	2.42	MINING		-	-	-	INCOMPLETE PUSH
2.42	4.43	MAINTENANCE & LUNCH					CHANGED CUTTER #18
							ASSEMBLED BELT STRUCTURE
4.43	5.07	MINING		1.50	3,4,6,8,13-24	14000	COMPLETED PUSH
5.07	5.19	RING INSTALLATION	646				
5.19	6.16	MINING		1.50	3,4,6,8,13-24	14000	-
6.16	6.30	RING INSTALLATION	647				
6.30	7.32	MINING		1.50	3,4,6,8,13-24	14000	-
7.32	7.46	RING INSTALLATION	648				
		-- SHIFT CHANGE------					
8.00	15.00	MAINTENANCE					CHANGED CUTTERS #13,18,30,31,41,42,43
							PINNED RING #646
							ASSORTED MACHINE MAINTENANCE
15.00	15.10	MINING		-	-	-	INCOMPLETE PUSH
15.10	15.25	DELAY					SECONDARY BELT STOPPED
15.25	15.45	MINING		0.50	1-4,13-24	12000	INCOMPLETE PUSH
15.45	16.10	-- SHIFT CHANGE------					
16.10	16.55	MINING		1.00	3,4,12-24	13000	COMPLETED PUSH
16.55	17.05	RING INSTALLATION	649				
17.05	17.45	MINING		-	-	-	INCOMPLETE PUSH
17.45	18.30	DELAY					POWER TROUBLE WITH #7 & 8 MAIN MOTORS
18.30	18.45	MINING		1.50	3,4.12-24	13000	COMPLETED PUSH
18.45	18.55	RING INSTALLATION	650				
18.55	20.05	MINING		1.50	3,4,12-24	13000	-
20.05	20.15	RING INSTALLATION	651				
20.15	20.40	LUNCH					
20.40	21.47	MINING		1.50	3,4,12-24	15000	-
21.47	21.57	RING INSTALLATION	652				
21.57	23.00	MINING		1.50	3,4,12-24	15000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 11,1984
Chainage :Start 1012.88 m
End 1027.90 m
Advance for day 15.02 m

File Name: DY04-11A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.00	23.10	RING INSTALLATION	653				
23.10	23.45	MINING		0.75	3,4,12-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date APRIL 12,1984
Chainage :Start 1027.90 m
End 1036.61 m
Advance for day 8.71 m

File Name: DY04-12A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.52	MINING		-	3,4,5,7,13-24	13500	INCOMPLETE PUSH
0.52	3.08	MAINTENANCE					PINNED RING 0652
							WHILE PUSHING OFF RING 0653; RING 0650 TURNED ON ITS AXIS
3.08	3.28	MINING		0.75	3,4,5,7,13-24	10000	COMPLETED PUSH
3.28	3.45	RING INSTALLATION	654				
3.45	4.10	LUNCH					
4.10	6.29	MAINTENANCE					ADDITIONAL PINNING TO RING 0652
6.29	7.42	MINING		0.95	3,4,5,7,13-24	9500	INCOMPLETE PUSH
7.42	8.00	-- SHIFT CHANGE------					
8.00	15.00	MAINTENANCE					CHANGE CUTTERS 027,28,32,39,40,42,43 ASSORTED MACHINE MAINTENANCE ADDITIONAL PINNING OF RING 0653 AGAINST THRUST
15.00	15.45	MINING		0.41	1-4,13-24	8000	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.30	MINING		0.14	3,4,12-24	12000	COMPLETED PUSH
16.30	16.45	RING INSTALLATION	655				
16.45	17.30	MINING		-	-	-	INCOMPLETE PUSH
17.30	17.45	DELAY					INSTALL MESH SHEETS & EXPNDO. RING 0654
17.45	18.33	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
18.33	18.45	RING INSTALLATION	656				
18.45	20.00	MINING		1.54	3,4,12-24	12000	-
20.00	20.10	RING INSTALLATION	657				
20.10	20.35	LUNCH					
20.35	21.40	MINING		1.50	3,4,12-24	13000	-
21.40	21.50	RING INSTALLATION	658				
21.50	23.00	MINING		1.50	3,4,12-24	13000	-
23.00	23.10	RING INSTALLATION	659				
23.10	23.45	MINING		0.80	3,4,11-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 13,1984
Chainage :Start 1036.61 m
End 1052.46 m
Advance for day 15.85 m

File Name: DY04-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.14	-- SHIFT CHANGE------					
0.14	0.57	MINING		0.70	3,4,13-24	14000	COMPLETED PUSH
0.57	1.11	RING INSTALLATION	660				
1.11	2.37	MINING		1.50	3,4,13-24	13.5-14500	T.B.M. CUTTING OUT FREQUENTLY
2.37	2.47	RING INSTALLATION	661				
2.47	3.41	MINING		1.50	3,4,9-24	14,500	-
3.41	3.55	RING INSTALLATION	662				
3.55	4.08	MINING			3,4,9,11,13-24	14000	INCOMPLETE PUSH
4.08	4.37	LUNCH					
4.37	4.46	MINING			3,4,9,11,13-24	14000	INCOMPLETE PUSH
4.46	5.01	DELAY					T.B.M. CUT OUT; ALSO INSTALL MESH
5.01	5.41	MINING		1.50	3,4,9,11,13-24	14000	COMPLETED PUSH
5.41	5.53	RING INSTALLATION	663				
5.53	6.54	MINING		1.50	3,4,9,11,13-24	14000	-
6.54	7.05	RING INSTALLATION	664				
7.05	7.42	MINING		1.03	3,4,9,11,13-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	12.50	MAINTENANCE					CHANGED CUTTERS #11,35,38,42,43 PINNED RING #662 SPLICE MAIN CONVEYOR BELT
12.50	13.23	MINING			9,11,13-24	12000	INCOMPLETE PUSH
13.23	15.05	DELAY					SECOND L-240 DRIVE CUTTING OUT
15.05	15.13	MINING		0.47	9,11,13-24	12000	COMPLETED PUSH
15.13	15.30	RING INSTALLATION	665				
15.30	15.45	DELAY					SECOND L-240 DRIVE CUTTING OUT
15.45	16.10	-- SHIFT CHANGE------					
16.10	17.10	MINING		1.50	3,4,12-24	14000	-
17.10	17.25	RING INSTALLATION	666				
17.25	18.30	DELAY					NO.2 CONVEYOR POWER TROUBLE(REPLACED GROUND FAULT RELAY)
18.30	19.30	MINING		1.50	3,4,12-24	13000	-
19.30	19.40	RING INSTALLATION	667				
19.40	20.00	MINING			3,4,12-24	14000	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.10	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
21.10	21.20	RING INSTALLATION	668				

Notes:

Donkin-Morgan Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 13,1984
Chainage :Start 1036.61 m
End 1052.46 m
Advance for day 15.85 m

File Name: DY04-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.20	22.15	MINING		1.50	3,4,12-24	14000	-
22.15	22.25	RING INSTALLATION	669				
22.25	23.25	MINING		1.50	3,4,12-24	14000	-
23.25	23.35	RING INSTALLATION	670				
23.35	23.45	MINING		0.15	3,4,12-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 14,1984
Chainage :Start 1052.46 m
End 1060.46 m
Advance for day 8.00 m

File Name: DY04-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE----					
0.16	1.12	MINING		1.35	3,4,9,11,13-24	15000	COMPLETED PUSH
1.12	1.27	RING INSTALLATION	671				
1.27	2.01	MINING			3,4,9,11,13-24	15000	INCOMPLETE PUSH
2.01	2.08	DELAY					SECONDARY CONVEYOR STOPPED
2.08	2.30	MINING		1.50	3,4,9,11,13-24	15000	COMPLETED PUSH
2.30	2.43	RING INSTALLATION	672				
2.43	3.42	MINING		1.50	3,4,9,11,13-24	15000	-
3.42	3.54	RING INSTALLATION	673				
3.54	4.16	MINING			3,4,9,11,13-24	15000	INCOMPLETE PUSH
4.16	4.45	LUNCH					
4.45	5.26	MINING		1.47	3,4,9,11,13-24	15000	COMPLETED PUSH
5.26	5.40	RING INSTALLATION	674				
5.40	6.45	MINING		1.50	3,4,9,11,13-24	15000	-
6.45	6.58	RING INSTALLATION	675				
6.58	7.40	MINING		0.68	3,4,9,11,13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE----					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date APRIL 16,1984
Chainage :Start 1060.46 m
End 1069.12 m
Advance for day 8.66 m

File Name: DY04-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	14.50	MAINTENANCE	-	-	-	-	CHANGED CUTTERS @10,36,37,42A,43A
							PINNED RING @674 WITH 4 SETS OF PINS
							ASSORTED MACHINE MAINTENANCE
14.50	15.06	MINING			3,4,9,11,13-24	15000	INCOMPLETE PUSH
15.06	15.22	DELAY					ATTEMPTED REMOVAL OF JAMMED CUTTER, NO
							SUCCESS
15.22	15.36	MINING		0.56	3,4,9,11,13-24	15000	COMPLETED PUSH
15.36	15.45	RING INSTALLATION	-	-	-	-	INSTALLATION NOT COMPLETED
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.28	RING INSTALLATION	676				INSTALLATION COMPLETED
16.28	17.25	MINING		1.50	13-24	14000	-
17.25	17.36	RING INSTALLATION	677				
17.36	18.40	MINING		1.50	13-24	14000	-
18.40	18.52	RING INSTALLATION	678				
18.52	19.50	MINING		1.50	13-24	14000	-
19.50	20.00	RING INSTALLATION	679				
20.00	20.30	LUNCH					
20.30	21.00	DELAY	-	-	-	-	PUMP WATER FROM FACE
21.00	22.00	MINING		1.50	1-4,13-24	14000	-
22.00	22.11	RING INSTALLATION	680				
22.11	23.06	MINING		1.50	1-8,13-24	14000	-
23.06	23.17	RING INSTALLATION	681				
23.17	23.45	MINING		0.60	1-8,13-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 17,1984
Chainage :Start 1069.12 m
End 1084.98 m
Advance for day 15.86 m

File Name: DY04-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.55	MINING		0.90	3,4,13-24	15000	COMPLETED PUSH
0.55	1.10	RING INSTALLATION	682				
1.10	2.20	MINING		1.50	3-8,13-24	15000	-
2.20	2.35	RING INSTALLATION	683				
2.35	2.55	MINING		-	-	-	INCOMPLETE PUSH
2.55	3.00	MAINTENANCE					CHECKED CUTTERS
3.00	3.55	MINING		1.50	3,4,9-24	15000	COMPLETED PUSH
3.55	4.10	RING INSTALLATION	684				
4.10	4.40	LUNCH					
4.40	5.45	MINING		1.50	3,4,9-24	15000	-
5.45	5.55	RING INSTALLATION	685				
5.55	7.05	MINING		1.50	3,4,11-24	15000	-
7.05	7.15	RING INSTALLATION	686				
7.15	7.45	MINING		0.60	3,4,11-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	14.58	MAINTENANCE					CHANGED CUTTERS #16,19,26,30,36,42A,43B; PINNED RING #684 WITH 4 SETS OF PINS; ASSORTED MACHINE MAINTENANCE
14.58	15.43	MINING		0.86	3,4,9-24	15000	COMPLETED PUSH
15.43	16.15	-- SHIFT CHANGE------					
16.15	16.30	RING INSTALLATION	687				
16.30	17.33	MINING		1.50	13-24	15000	-
17.33	17.50	RING INSTALLATION	688				
17.50	18.48	MINING		1.50	13-24	15000	-
18.48	19.00	RING INSTALLATION	689				
19.00	19.05	MINING		-	-	-	INCOMPLETE PUSH
19.05	19.20	DELAY					PRIMARY CONVEYOR OVERLOADED
19.20	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.45	MINING		1.50	13-24	15000	COMPLETED PUSH
20.45	21.00	RING INSTALLATION	690				
21.00	21.51	MINING		1.50	13-24	15000	-
21.51	22.03	RING INSTALLATION	691				
22.03	22.48	MINING		-	-	-	INCOMPLETE PUSH
22.48	23.15	DELAY					RING #690 STARTED TO TWIST

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 17,1984
Chainage :Start 1069.12 m
End 1084.98 m
Advance for day 15.86 m

File Name: DY04-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.15	23.30	MINING		1.50	13-24	15000	COMPLETED PUSH
23.30	23.45	MAINTENANCE -- SHIFT CHANGE--					PINNED RING #690

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 18,1984 File Name: DY04-18A

Chainage :Start 1084.98 m

End 1096.95 m Project No: 831-6014

Advance for day 11.97 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.25	-- SHIFT CHANGE------					
0.25	0.45	MAINTENANCE					COMPLETED PINNING RING #690
0.45	1.00	RING INSTALLATION	692				
1.00	2.30	MINING		1.50	3,4,10-24	12500	OPERATING WITHOUT NO.5 & 6 MAIN DRIVE MOTORS
2.30	2.40	RING INSTALLATION	693				
2.40	2.45	MINING		-	-	-	INCOMPLETE PUSH
2.45	6.55	MAINTENANCE					REMOVED TORN SECTION OF PRIMARY BELT AND INSTALLED TWO SPLICES
6.55	7.45	MINING		1.20	3,4,10-24	12500	INCOMPLETE PUSH ALL MAIN DRIVE MOTORS OPERATING
		-- SHIFT CHANGE------					
8.00	13.15	MAINTENANCE		-	-	-	CHANGED CUTTERS #20,42,43 REMOVED JAMMED CUTTER PINNED RING #692 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
13.15	13.30	MINING		0.30	3,4.5,9-24	15000	COMPLETED PUSH
13.30	13.43	RING INSTALLATION	694				
13.43	14.36	MINING		1.50	3,4.5,9-24	15000	-
14.36	14.47	RING INSTALLATION	695				
14.47	15.30	MINING		1.20	9-24	15000	INCOMPLETE PUSH
15.30	15.45	MAINTENANCE		-	-	-	REPLACED SHOE ON WEST SIDE OF EXPANSION JOINT ON RING#694. (PLATE BROKE OFF WHILE EXPANDING)
15.45	16.17	-- SHIFT CHANGE------					
16.17	16.35	MINING		0.30	12-24	15000	COMPLETED PUSH
16.35	16.55	RING INSTALLATION	696				
16.55	17.57	MINING		1.50	12-24	15000	-
17.57	18.13	RING INSTALLATION	697				
18.13	19.27	MINING		1.50	12-24	15000	-
19.27	19.50	RING INSTALLATION	698				
19.50	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.40	MINING		-	-	-	INCOMPLETE PUSH
20.40	20.50	DELAY					T.B.M. CUTTING OUT,ELECTRICAL PROBLEMS
20.50	21.27	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project

Rock Support Interaction Study

DAILY REPORT (Tunnel # 2)

Date APRIL 18,1984 File Name: DY04-18A

Chainage :Start 1084.98 m

End 1096.95 m Project No: 831-6014

Advance for day 11.97 m

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
21.27	21.35	DELAY					T.B.M. CUTTING OUT,ELECTRICAL PROBLEMS
21.35	21.46	MINING		1.47	12-24	15000	COMPLETED PUSH
21.46	22.00	RING INSTALLATION	699				
22.00	22.50	MINING		-	-	-	INCOMPLETE PUSH
22.50	23.06	DELAY					T.B.M. CUTTING OUT,ELECTRICAL PROBLEMS
23.06	23.21	MINING		1.50	12-24	15000	COMPLETED PUSH
23.21	23.43	RING INSTALLATION	700				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 19,1984
Chainage :Start 1096.95 m
End 1116.07 m
Advance for day 19.12 m

File Name: DY04-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.20	MINING		1.50	3,4,11-24	13000	-
1.20	1.35	RING INSTALLATION	701				
1.35	2.43	MINING		1.46	3,4,13-24	13000	-
2.43	2.58	RING INSTALLATION	702				
2.58	4.05	MINING		1.50	3,4,11-24	13000	-
4.05	4.20	RING INSTALLATION	703				
4.20	4.50	LUNCH					
4.50	6.00	MINING		1.50	3,4,13-24	14000	-
6.00	6.15	RING INSTALLATION	704				
6.15	7.25	MINING		1.46	3,4,11-24	15000	-
7.25	7.40	RING INSTALLATION	705				
7.40	7.45	MINING		-	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	11.30	MAINTENANCE		-	-	-	CHANGED CUTTERS #39,42,43 PINNED RING #703 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
11.30	12.00	MINING		-	-	-	INCOMPLETE PUSH
12.00	12.30	LUNCH					
12.30	12.34	MINING		-	-	-	INCOMPLETE PUSH
12.34	12.41	DELAY					SECONDARY CONVEYOR SLIPPING
12.41	13.06	MINING		1.50	3,4.5,9-11,13 -24	15000	COMPLETED PUSH
13.06	13.16	RING INSTALLATION	706				
13.16	14.12	MINING		1.50	3,4.5,9-11,13 -24	15000	-
14.12	14.27	RING INSTALLATION	707				
14.27	15.20	MINING		1.50	9-11,13-24	15000	-
15.20	15.30	RING INSTALLATION	708				
15.30	15.44	MINING		0.25	9-24	14-15000	INCOMPLETE PUSH
15.44	16.13	-- SHIFT CHANGE------					
16.13	17.00	MINING		1.25	9-24	15000	COMPLETED PUSH
17.00	17.21	RING INSTALLATION	709				
17.21	17.25	MINING		-	-	-	INCOMPLETE PUSH
17.25	17.45	DELAY					T.B.M.CUTTING OUT,ELECTRICAL PROBLEMS
17.45	18.32	MINING		1.50	9-24	15000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 19,1984 File Name: DY04-19A
Chainage :Start 1096.95 m
End 1116.07 m Project No: 831-6014
Advance for day 19.12 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.32	18.50	RING INSTALLATION	710				
18.50	19.40	MINING		1.50	1-4,13-24	15000	-
19.40	20.00	RING INSTALLATION	711				
20.00	20.30	LUNCH					
20.30	21.25	MINING		1.50	1-4,13-24	15000	-
21.25	21.38	RING INSTALLATION	712				
21.38	22.20	MINING		1.20	9-24	14000	INCOMPLETE PUSH
22.20	23.45	DELAY					BROKEN RETURN HYDRAULIC LINE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 20,1984
Chainage :Start 1116.07 m
End 1121.16 m
Advance for day 5.09 m

File Name: DY04-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	— SHIFT CHANGE———					
0.15	0.35	DELAY		-	-	-	COMPLETED CONNECTING MAIN SUPPLY HOSE, #2 PUMP.
0.35	0.55	MINING		0.30	3,4,11-24	13000	COMPLETED PUSH
0.55	1.08	RING INSTALLATION	713				
1.08	2.08	MINING		1.50	3,4,13-24	14000	-
2.08	2.23	RING INSTALLATION	714				
2.23	2.30	MAINTENANCE					FLUSHED OUT WATER SPRAYS
2.30	3.55	MINING		1.46	3,4,13-24	14000	-
3.55	4.10	RING INSTALLATION	715				
4.10	4.40	LUNCH					
4.40	5.00	MAINTENANCE		-	-	-	CONNECTED WATER DISCHARGE PUMP
5.00	6.03	MINING		1.50	3,4,13-24	15000	-
6.03	6.18	RING INSTALLATION	716				
6.18	6.38	MINING		0.33	3,4,13-24	15000	INCOMPLETE PUSH
6.38	7.45	MAINTENANCE		-	-	-	STARTED NO.2 CONVEYOR BELT EXTENSION
		— SHIFT CHANGE———					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 23,1984
Chainage :Start 1121.26 m
End 1129.93 m
Advance for day 8.67 m

File Name: DY04-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	14.45	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #19,23,29,32,34,37,42B, 43A.
							ASSORTED MACHINE MAINTENANCE
14.45	15.45	MINING		1.17	3,4,11-24	14000	COMPLETED PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.29	RING INSTALLATION	717				
16.29	17.08	MINING		-	-	-	INCOMPLETE PUSH
17.08	17.16	DELAY					T.B.M.CUTTING OUT, ELECTRICAL PROBLEMS "SCRUBBER FLOW" RED LIGHT ON
17.16	17.45	MINING		1.50	3,4,9,11,13-24	15000	COMPLETED PUSH
17.45	17.58	RING INSTALLATION	718				
17.58	18.15	MINING		-	-	-	INCOMPLETE PUSH
18.15	18.29	DELAY					REMOVED SCRAPER ON PRIMARY CONVEYOR SECTION, INSIDE T.B.M.HEAD(HANGING OFF)
18.29	19.12	MINING		1.50	3,4,9,11,13-24	15000	COMPLETED PUSH
19.12	19.31	RING INSTALLATION	719				
19.31	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.06	MINING		1.50	3,4,9,11,13-24	15000	COMPLETED PUSH
21.06	21.20	RING INSTALLATION	720				
21.20	22.20	MINING		1.50	3,4,9-24	15000	-
22.20	22.34	RING INSTALLATION	721				
22.34	22.53	MINING		-	-	-	INCOMPLETE PUSH
22.53	22.58	DELAY					MAIN BELT SLIPPING
22.58	23.45	MINING		1.50	3,4,9-24	14-15000	COMPLETED PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 24,1984
Chainage :Start 1129.93 m
End 1146.00 m
Advance for day 16.07 m

File Name: DY04-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.30	RING INSTALLATION	722				
0.30	1.00	MAINTENANCE		-	-	-	ADJUST SIDE SCRAPERS ON PRIMARY CONVEYOR
1.00	1.46	MINING		-	-	-	INCOMPLETE PUSH
1.46	3.20	DELAY					LOWER HEAD ROLLER JAMMED ON MAIN BELT
3.20	3.25	MINING		1.50	1-4,9-24	15000	COMPLETED PUSH
3.25	3.37	RING INSTALLATION	723				
3.37	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.01	MINING		1.47	1-4,9-24	15000	COMPLETED PUSH
5.01	5.12	RING INSTALLATION	724				
5.12	6.08	MINING		1.50	1-4,9-24	15000	-
6.08	6.20	RING INSTALLATION	725				
6.20	7.10	MINING		1.50	1-4,9-24	15000	-
7.10	7.18	RING INSTALLATION	726				
7.18	7.45	MINING		1.00	1-4,9-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	14.10	MAINTENANCE		-	-	-	CHANGED CUTTERS #28,42B,43A. PINNED RING #724 WITH 2 SETS OF PINS SPLICED PRIMARY BELT
14.10	14.40	MINING		0.50	3,4,9-24	13000	COMPLETED PUSH
14.40	15.00	RING INSTALLATION	727				
15.00	15.45	MINING		1.20	-	-	INCOMPLETE PUSH
15.45	16.30	-- SHIFT CHANGE------					
16.30	16.52	MINING		0.30	3,4,9-24	13000	COMPLETED PUSH
16.52	17.15	RING INSTALLATION	728				
17.15	18.21	MINING		1.50	3,4,9-20	14500	-
18.21	18.39	RING INSTALLATION	729				
18.39	19.44	MINING		1.50	3,4,9-20	14-15000	-
19.44	19.59	RING INSTALLATION	730				
19.59	20.31	LUNCH					
20.31	21.28	MINING		1.50	3,4,9-24	13.5-14500	-
21.28	21.40	RING INSTALLATION	731				
21.40	22.43	MINING		1.50	3,4,9-24	12-14000	-
22.43	22.58	RING INSTALLATION	732				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 24,1984 File Name: DY04-24A
Chainage :Start 1129.93 m
End 1146.00 m Project No: 831-6014
Advance for day 16.07 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.58	23.45	MINING -- SHIFT CHANGE------		1.10	3-8,13-24	12-14000	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 25,1984
Chainage :Start 1146.00 m
End 1160.65 m
Advance for day 14.65 m

File Name: DY04-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.35	MINING		0.40	1-4,9-24	15000	COMPLETED PUSH
0.35	0.50	RING INSTALLATION	733				
0.50	1.48	MINING		1.50	1-4,9-24	15000	-
1.48	1.57	RING INSTALLATION	734				
1.57	2.47	MINING		1.50	1-4,9-24	15000	-
2.47	3.00	RING INSTALLATION	735				
3.00	3.54	MINING		1.50	1-4,9-24	15000	-
3.54	4.05	RING INSTALLATION	736				
4.05	4.35	LUNCH					
4.35	5.28	MINING		1.50	1-4,9-24	15000	-
5.28	5.40	RING INSTALLATION	737				
5.40	6.47	MINING		1.50	1-4,9-24	15000	-
6.47	7.05	RING INSTALLATION	738				
7.05	7.45	MINING		0.90	1-4,9-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #18,24,25,27,29,30,38, 40,42B,43A. PINNED RING #736 WITH 2 SETS OF PINS ASSORTED MACHINE MAINTENANCE
16.00	16.14	-- SHIFT CHANGE------					
16.14	16.40	MAINTENANCE		-	-	-	COMPLETE CUTTER CHANGE
16.40	16.47	MINING					SET UP ONLY
16.47	17.43	DELAY		-	-	-	NO POWER IN TUNNEL
17.43	18.10	MINING		0.60	3-24	15000	COMPLETED PUSH
18.10	18.24	RING INSTALLATION	739				
18.24	19.24	MINING		1.50	3,4,6,8,10,12, 13-24	15000	-
19.24	19.38	RING INSTALLATION	740				
19.38	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.40	MAINTENANCE		-	-	-	CHECKED CUTTERS
20.40	21.17	MINING		1.50	3,4,6,8,10,12, 13-24	15000	COMPLETED PUSH
21.17	21.32	RING INSTALLATION	741				
21.32	22.00	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 25,1984
Chainage :Start 1146.00 m
End 1160.65 m
Advance for day 14.65 m

File Name: DY04-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.00	22.10	MAINTENANCE		-	-	-	INSTALL MESH EXPANDED #740 RING (BAD ROOF)
22.10	22.46	MINING		1.50	3-8,10,12, 13-24	15000	COMPLETED PUSH
22.46	23.00	RING INSTALLATION	742				
23.00	23.20	MINING		-	-	-	INCOMPLETE PUSH
23.20	23.35	MAINTENANCE		-	-	-	INSTALL MESH EXPANDED #741 RING
23.35	23.45	MINING		0.75	3,4,6,8,10,12, 13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel @ 2)

Date APRIL 26,1984
Chainage :Start 1160.65 m
End 1175.50 m
Advance for day 14.85 m

File Name: DY04-26A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	-- SHIFT CHANGE------					
0.10	0.38	MINING		0.75	1-8,11-24	13000	COMPLETED PUSH
0.38	0.48	RING INSTALLATION	743				
0.48	1.42	MINING		1.50	1-8,11-24	13000	-
1.42	1.52	RING INSTALLATION	744				
1.52	2.42	MINING		1.50	1-8,11-24	13000	-
2.42	3.00	RING INSTALLATION	745				
3.00	4.00	MINING		1.50	1-8,11-24	14000	-
4.00	4.15	RING INSTALLATION	746				
4.15	4.42	LUNCH					
4.42	5.38	MINING		1.50	1-4,13-24	14000	-
5.38	5.50	RING INSTALLATION	747				
5.50	6.36	MINING		1.50	1-4,13-24	13000	-
6.36	6.50	RING INSTALLATION	748				
6.50	7.00	MINING		0.25	1-4,13-24	14000	INCOMPLETE PUSH
7.00	7.45	DELAY					BROKEN RETURN HYDRAULIC LINE ON MOTOR #8
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #1,2,5,24,31,39,42B,43A; PINNED RING #746 WITH 2 SETS OF PINS; COMPLTD REPAIR OF #8 MOTOR HYDRLC LINE; ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.45	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
15.45	16.16	-- SHIFT CHANGE------					
16.16	16.34	MINING		-	-	-	INCOMPLETE PUSH, 6 MOTORS OPERATING
16.34	16.43	DELAY					MAIN CONVEYOR STOPPED
16.43	17.28	MINING		1.25	3,4,9-24	15000	COMPLETED PUSH
17.28	17.42	RING INSTALLATION	749				
17.42	18.12	MINING		-	-	-	INCOMPLETE PUSH, 8 MOTORS OPERATING
18.12	18.19	DELAY					INSTALL MESH AND LAGGING
18.19	18.54	MINING		1.50	3,4,9-24	15000	#3 & 4 MOTORS OFF AT 18.39
18.54	19.08	RING INSTALLATION	750				
19.08	19.20	DELAY					REROUTED LEAKING HYDRAULIC FITTING FOR PUSH RING POWER (REPAIRED LATER)
19.20	20.00	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date APRIL 26,1984
Chainage :Start 1160.65 m
End 1175.50 m
Advance for day 14.85 m

File Name: DY04-26A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.00	20.30	LUNCH					
20.30	21.16	MINING		1.50	3,4,9-24	14-15000	COMPLETED PUSH
21.16	21.33	RING INSTALLATION	751				
21.33	22.50	MINING		1.50	3,4,9-24	15000	6 MOTORS OPERATING
22.50	23.02	RING INSTALLATION	752				
23.02	23.45	MINING		0.60	3,4,9-24	13-15000	INCOMPLETE PUSH, 6 MOTORS OPERATING
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 27,1984
Chainage :Start 1175.50 m
End 1191.65 m
Advance for day 16.15 m

File Name: DY04-27A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE----					
0.15	0.55	MINING		0.90	1-24	13000	COMPLETED PUSH
0.55	1.10	RING INSTALLATION	753				
1.10	2.00	MINING		-	-	-	INCOMPLETE PUSH
2.00	4.00	DELAY					HYDRAULIC HOSE BROKEN
4.00	4.30	LUNCH					
4.30	4.55	DELAY					COMPLETE HYDRAULIC HOSE REPAIR
4.55	5.05	MINING		1.50	1-24	12000	COMPLETED PUSH
5.05	5.17	RING INSTALLATION	754				
5.17	6.30	MINING		1.50	1-24	12000	-
6.30	6.41	RING INSTALLATION	755				
6.41	7.45	MINING		1.30	1-24	12000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE----					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #17,35,36,41,42B,43A PINNED RING #754 WITH 2 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	12.50	MINING		-	-	-	SET UP ONLY
12.50	13.10	MINING		0.20	3,4,9-24	12000	COMPLETED PUSH
13.10	13.25	RING INSTALLATION	756				
13.25	13.43	DELAY					INSTALL MESH AND LAGGING NO. 2 BELT STOPPED(ACCIDENTLY TRIPPED)
13.43	14.45	MINING		1.50	3,4,9-24	12000	-
14.45	14.57	RING INSTALLATION	757				INSTALL MESH AND LAGGING
14.57	15.45	MINING		1.15	3-8,13-24	12000	INCOMPLETE PUSH
15.45	16.16	-- SHIFT CHANGE----					
16.16	16.32	MINING		0.35	1-8,10,12-24	14000	COMPLETED PUSH
16.32	16.48	RING INSTALLATION	758				
16.48	17.49	MINING		1.50	1-8,10,12-24	13-15000	-
17.49	18.03	RING INSTALLATION	759				
18.03	19.06	MINING		1.50	1-8,10,12-24	13-15000	-
19.06	19.20	RING INSTALLATION	760				
19.20	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.53	MINING		1.50	1-8,10,12-24	13-15000	COMPLETED PUSH
20.53	21.04	RING INSTALLATION	761				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 27,1984
Chainage :Start 1175.50 m
End 1191.65 m
Advance for day 16.15 m

File Name: DY04-27A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
21.04	21.30	MINING		-	-	-	INCOMPLETE PUSH
21.30	21.35	DELAY					INSTALL MESH AND LAGGING
21.35	22.08	MINING		1.50	1-8,10,12-24	12-14000	COMPLETED PUSH
22.08	22.23	RING INSTALLATION	762				
22.23	23.21	MINING		1.50	1-8,10,12-24	12-14000	-
23.21	23.36	RING INSTALLATION	763				
23.36	23.45	MINING		0.25	1-8,10,12-24	12-14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkia-Morien Developaent Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 26,1984
Chainage :Start 1191.65 m
End 1199.66 m
Advance for day 8.01 m

File Name: DY04-28A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	1.10	MINING		1.25	1-4,13-24	11000	COMPLETED PUSH
1.10	1.24	RING INSTALLATION	764				
1.24	2.22	MINING		1.50	1-4,13-24	12000	-
2.22	2.40	RING INSTALLATION	765				
2.40	3.38	MINING		1.50	1-4,13-24	13000	-
3.38	3.55	RING INSTALLATION	766				
3.55	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	5.35	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
5.35	5.50	RING INSTALLATION	767				
5.50	6.28	MINING		-	-	-	INCOMPLETE PUSH
6.28	6.35	DELAY					T.B.M. DOWN, (SWITCH GEAR)
6.35	6.50	MINING		1.50	1-4,13-24	15000	COMPLETED PUSH
6.50	7.05	RING INSTALLATION	768				
7.05	7.45	MINING		0.80	1-4,13-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date APRIL 30,1984
Chainage :Start 1199.66 m
End 1201.83 m
Advance for day 2.17 m

File Name: DY04-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #8,9,12,13,15,26,37, 42B,43A.
							PINNED RING #766 WITH 4 SETS OF PINS
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.00	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
15.00	15.45	DELAY					ADJUST MUCK SCRAPERS ON CUTTER HEAD
15.45	16.15	-- SHIFT CHANGE------					
16.15	19.30	MAINTENANCE	-	-	-	-	WORK ON SECONDARY CONVEYOR
19.30	19.54	MINING		0.70	3,4,9-24	13000	COMPLETED PUSH
19.54	20.06	RING INSTALLATION	769				
20.06	20.30	LUNCH					
20.30	20.48	MINING		-	-	-	INCOMPLETE PUSH
20.48	20.57	DELAY					SECONDARY CONVEYOR STOPPED(TROUBLE
							RESTARTING MACHINE)
20.57	21.18	MINING		-	-	-	INCOMPLETE PUSH
21.18	23.18	DELAY					ELECTRICAL TROUBLE
23.18	23.35	MINING		1.50	3,4,9-24	12-13000	COMPLETED PUSH
23.35	23.46	RING INSTALLATION	770				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 01,1984
Chainage :Start 1201.83 m
End 1217.18 m
Advance for day 15.35 m

File Name: DY05-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.20	MINING		1.50	3,4,9-24	12000	-
1.20	1.36	RING INSTALLATION	771				
1.36	2.42	MINING		1.50	3,4,9-24	12000	-
2.42	2.59	RING INSTALLATION	772				
2.59	4.06	MINING		1.50	3,4,9-24	12-14000	-
4.06	4.35	LUNCH					
4.35	4.51	RING INSTALLATION	773				
4.51	5.25	MINING		-	-	-	INCOMPLETE PUSH
5.25	5.30	DELAY					INSTALL MESH
5.30	5.58	MINING		-	-	-	INCOMPLETE PUSH
5.58	6.02	DELAY					T.B.M. CUTTING OUT
6.02	6.08	MINING		1.50	3,4,9-24	15000	COMPLETED PUSH
6.08	6.22	RING INSTALLATION	774				
6.22	6.55	MINING		-	-	-	INCOMPLETE PUSH
6.55	7.05	MAINTENANCE					CHECK CUTTERS
7.05	7.38	MINING		1.50	3,4,9-24	15000	COMPLETED PUSH
7.38	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #6,11,16,20,32,33, 42B,43A.
							PINNED ARCH #773 WITH 4 SETS OF PINS
							ASSORTED MACHINE MAINTENANCE
		RING INSTALLATION	775				
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
14.00	15.45	MAINTENANCE					TIGHTEN CENTRE BOLT ASSEMBLIES ON T.B.M; ADJUST MUCK SCRAPERS.
15.45	16.10	-- SHIFT CHANGE------					
16.10	17.30	MAINTENANCE	-	-	-	-	ADJUSTED BELT TENSION ON #2 CONVEYOR
17.30	18.20	MINING		1.50	3,4,9,11,13-24	12000	-
18.20	18.30	RING INSTALLATION	776				
18.30	19.25	MINING		1.50	3,4,9,11,13-24	12000	-
19.25	19.35	RING INSTALLATION	777				
19.35	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.05	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
21.05	21.15	RING INSTALLATION	778				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MAY 01,1984
Chainage: Start 1201.83 m
End 1217.18 m
Advance for day 15.35 m

File Name: DY05-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.15	22.10	MINING		1.50	3,4,9,13-24	12000	-
22.10	22.20	RING INSTALLATION	779				
22.20	23.20	MINING		1.50	3,4,9,13-24	12000	-
23.20	23.30	RING INSTALLATION	780				
23.30	23.45	MINING		0.35	3,4,9,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkia-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 02,1984
Chainage :Start 1217.18 m
End 1233.29 m
Advance for day 16.11 m

File Name: DY05-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.14	-- SHIFT CHANGE------					
0.14	0.55	MINING		1.15	3-8,13-24	12-15000	COMPLETED PUSH
0.55	1.08	RING INSTALLATION	781				
1.08	2.08	MINING		1.50	3-8,13-24	12-13000	-
2.08	2.24	RING INSTALLATION	782				
2.24	3.29	MINING		1.50	3-8,13-24	12-13000	-
3.29	3.45	RING INSTALLATION	783				
3.45	4.07	MINING		-	-	-	INCOMPLETE PUSH
4.07	4.39	LUNCH					
4.39	5.27	MINING		1.50	3-8,17-24	14000	COMPLETED PUSH
5.27	5.48	RING INSTALLATION	784				
5.48	6.38	MINING		-	-	-	INCOMPLETE PUSH
6.38	6.50	DELAY					ELECTRICAL TROUBLE
6.50	7.00	MINING		1.50	3-8,17-24	14-15000	COMPLETED PUSH
7.00	7.15	RING INSTALLATION	785				
7.15	7.45	MINING		0.65	3-8,13-24	13000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	10.00	MAINTENANCE		-	-	-	CHANGE CUTTERS 834,42B,43
10.00	12.00	MAINTENANCE		-	-	-	CLEAN T.B.M.(PUMP AREA MUCK)
12.00	12.30	LUNCH					
12.30	12.45	MINING		0.10	1-4,13-24	13000	INCOMPLETE PUSH
12.45	15.45	DELAY					REMOVE THRUST BEAMS FROM STABLE AREA
15.45	16.10	-- SHIFT CHANGE------					
16.10	16.50	MINING		0.75	3-4,11-24	11000	COMPLETED PUSH
16.50	17.00	RING INSTALLATION	786				
17.00	18.10	MINING		1.50	3-4,11-24	11000	-
18.10	18.25	RING INSTALLATION	787				
18.25	19.30	MINING		1.50	3,4,11-24	11000	-
19.30	19.45	RING INSTALLATION	788				
19.45	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.20	MINING		1.46	3,4,11-24	12000	COMPLETED PUSH
21.20	21.30	RING INSTALLATION	789				
21.30	22.30	MINING		1.50	3,4,11-24	12000	-
22.30	22.40	RING INSTALLATION	790				
22.40	23.45	MINING		1.50	3,4,11-24	12000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 02,1984
Chainage :Start 1217.18 m
End 1233.29 m
Advance for day 16.11 m

File Name: DY05-02A
Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 03,1984
Chainage :Start 1233.29 m
End 1247.54 m
Advance for day 14.25 m

File Name: DY05-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	0.34	RING INSTALLATION	791				
0.34	1.50	MINING		1.50	1-4,13-24	11-11500	-
1.50	2.05	RING INSTALLATION	792				
2.05	2.24	MINING		-	-	-	INCOMPLETE PUSH
2.24	2.39	DELAY					ELECTRICAL TROUBLE
2.39	3.46	MINING		1.50	1-4,7,8,10-12, 17-24	11500	COMPLETED PUSH
3.46	4.04	RING INSTALLATION	793				
4.04	4.33	LUNCH					
4.33	6.02	MINING		1.50	1-4,13-24	11000	T.B.M. CUT OUT SEVERAL TIMES,(APPROX. TIME LOSS = 5 MIN.)
6.02	6.09	MAINTENANCE					CHECK CUTTERS
6.09	6.24	RING INSTALLATION	794				
6.24	7.36	MINING		1.50	1-4,13-24	11500	-
7.36	7.45	RING INSTALLATION	795				
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #29,42,43. PINNED RING #793 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.45	MAINTENANCE	-	-	-	-	CLEAN MUCK FROM CAVITY BETWEEN MAIN BEARING AND OUTER CUTTER SHIELD AND REFILL WITH GREASE.
15.45	16.12	-- SHIFT CHANGE------					
16.12	17.22	MINING		1.50	1-4,7,8,11-24	11000	-
17.22	17.34	RING INSTALLATION	796				
17.34	18.34	MINING		1.50	1-4,7,8,11-24	10500	-
18.34	18.45	RING INSTALLATION	797				
18.45	19.00	DELAY					INSTALL ADDITIONAL LUBRICATING PUMP ON T.B.M.
19.00	20.00	MINING		1.50	1-4,7,8,12-24	10500	-
20.00	20.30	LUNCH					
20.30	20.43	RING INSTALLATION	798				
20.43	21.48	MINING		1.50	1-4,7,8,13-24	10500	-
21.48	22.00	RING INSTALLATION	799				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 03,1984
Chainage :Start 1233.29 m
End 1247.54 m
Advance for day 14.25 m

File Name: DY05-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.00	23.00	MINING		1.50	1-4,11-24	10500	-
23.00	23.10	RING INSTALLATION	800				
23.10	23.45	MINING		0.75	1-4,11-24	10500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 04,1984
Chainage :Start 1247.54 m
End 1260.19 m
Advance for day 12.65 m

File Name: DY05-04A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.49	MINING		0.75	1-4,11-24	11000	COMPLETED PUSH
0.49	1.04	RING INSTALLATION	B01				
1.04	2.24	MINING		1.50	1-4,11-24	11000	-
2.24	2.33	RING INSTALLATION	B02				
2.33	2.40	MINING		-	-	-	INCOMPLETE PUSH
2.40	2.47	DELAY					SECONDARY CONVEYOR "LOCKED OUT"
2.47	3.57	MINING		1.50	1-4,12-24	10-11500	COMPLETED PUSH
3.57	4.28	LUNCH					
4.28	4.42	RING INSTALLATION	B03				
4.42	5.50	MINING		1.50	3,4,8,11-24	11500	-
5.50	6.01	RING INSTALLATION	B04				
6.01	7.09	MINING		1.50	3,4,8,11-24	11500	-
7.09	7.22	RING INSTALLATION	B05				
7.22	7.45	MINING		0.45	3,4,11,12, 17-24.	11500	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #21,38,40,42B,43A. PINNED RING #B03 ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.45	MAINTENANCE	-	-	-	-	FINISH CHANGING CUTTERS
13.45	15.45	MAINTENANCE	-	-	-	-	CLEAN MUCK FROM BETWEEN MAIN BEARING AND OUTER SHELL
15.45	16.10	-- SHIFT CHANGE------					
16.10	18.30	MAINTENANCE	-	-	-	-	FINISH SPLICING PRIMARY BELT
18.30	19.20	MINING		1.05	3,4,11-24	11000	COMPLETED PUSH
19.20	19.30	RING INSTALLATION	B06				
19.30	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.20	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
21.20	21.30	RING INSTALLATION	B07				
21.30	22.40	MINING		1.50	3,4,8,11-24	11000	-
22.40	22.50	RING INSTALLATION	B08				
22.50	23.45	MINING		1.40	3,4,7,8,12-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 05,1984
Chainage :Start 1260.19 m
End 1267.29 m
Advance for day 7.10 m

File Name: DY05-05A
Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.25	MINING		0.10	3,4,7,8,12-24	10500	COMPLETED PUSH
0.25	0.40	RING INSTALLATION	809				
0.40	1.50	MINING		1.50	3,4,7,8,16-24	11000	-
1.50	2.00	RING INSTALLATION	810				
2.00	3.35	MINING		1.50	3,4,7,8,14, 16-24	12000	-
3.35	3.45	RING INSTALLATION	811				
3.45	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.25	MINING		1.50	3,4,7,8,13-24	12000	COMPLETED PUSH
5.25	5.38	RING INSTALLATION	812				
5.38	6.45	MINING		1.50	3,4,7,8,11-24	12500	-
6.45	7.00	RING INSTALLATION	813				
7.00	7.45	MINING		1.00	3,4,7,8,11-24	12500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 07,1984
Chainage :Start 1267.00 m
End 1275.00 m
Advance for day 8.00 m

File Name: DY05-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS # 18,22,28,29,35,39, 41,42,43B. PINNED RING 0811 WITH 4 SETS OF PINS
12.00	12.30	LUNCH					
12.30	15.10	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE FINISH CHANGING CUTTERS
15.10	15.32	MINING		0.50	1-4,11-24	11000	COMPLETED PUSH
15.32	15.44	RING INSTALLATION	-	-	-	-	INSTALLATION NOT COMPLETED
15.44	16.13	-- SHIFT CHANGE------					
16.13	16.20	RING INSTALLATION	814	-	-	-	INSTALLATION COMPLETED
16.20	16.25	MINING		-	-	-	INCOMPLETE PUSH
16.25	16.35	DELAY					MAIN CONVEYOR TRIPPED OUT
16.35	16.50	MINING		-	-	-	INCOMPLETE PUSH
16.50	17.05	DELAY					MAIN CONVEYOR TRIPPED OUT
17.05	17.30	MINING		1.50	1-4,7,8,17-24	12500	COMPLETED PUSH
17.30	17.58	RING INSTALLATION	815				
17.58	19.00	MINING		1.50	1-8,13-24	15000	-
19.00	19.10	RING INSTALLATION	816				
19.10	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.00	MINING		1.50	1-8,13-24	15000	COMPLETED PUSH
21.00	21.12	RING INSTALLATION	817				
21.12	22.33	MINING		1.50	1-8,13-24	15000	-
22.33	22.48	RING INSTALLATION	818				
22.48	23.45	MINING		1.50	1-8,13-24	15000	-
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 08,1984
Chainage :Start 1275.00 m
End 1290.70 m
Advance for day 15.70 m

File Name: DY05-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.25	DELAY					POWER OFF IN TUNNEL
0.25	0.40	RING INSTALLATION	819				
0.40	1.50	MINING		1.50	3,4,11-24	13000	-
1.50	2.05	RING INSTALLATION	820				
2.05	3.05	MINING		1.50	3,4,7,8,11-24	13000	-
3.05	3.18	RING INSTALLATION	821				
3.18	4.10	MINING		1.50	3-8,11-24	13000	-
4.10	4.25	RING INSTALLATION	822				
4.25	4.55	LUNCH					
4.55	6.00	MINING		1.50	3,4,11-24	13000	-
6.00	6.15	RING INSTALLATION	823				
6.15	7.05	MINING		1.50	3-8,13-24	13000	-
7.05	7.20	RING INSTALLATION	824				
7.20	7.45	MINING		0.50	3-8,13-24	13000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #14,20,27,36,42B,43A CHANGED IMPELLORS ON ENGART FAN(FOR SCRUBBER SYSTEM) ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
15.40	15.50	DELAY					POWER OFF IN TUNNEL
15.50	16.15	-- SHIFT CHANGE------					
16.15	17.05	DELAY	-	-	-	-	WAITING FOR ELECTRICIAN TO RESET L-240 AFTER POWER OUTAGE
17.05	17.45	MINING		1.00	1-8,13-24	13000	COMPLETED PUSH
17.45	17.55	RING INSTALLATION	825				
17.55	18.55	MINING		1.50	1-4,13-24	14000	-
18.55	19.05	RING INSTALLATION	826				
19.05	20.00	MINING		1.50	1-4,13-24	14000	-
20.00	20.30	LUNCH					
20.30	20.45	RING INSTALLATION	827				
20.45	21.52	MINING		1.50	1-4,13-24	14000	-
21.52	22.05	RING INSTALLATION	828				
22.05	23.02	MINING		1.50	1-4,13-24	14000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 08,1984
Chainage :Start 1275.00 m
End 1290.70 m
Advance for day 15.70 m

File Name: DY05-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.02	23.10	RING INSTALLATION	829				
23.10	23.45	MINING		0.70	1-4,13-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 09,1984
Chainage :Start 1290.70 m
End 1306.25 m
Advance for day 15.55 m

File Name: DY05-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.30	MINING		-	-	-	INCOMPLETE PUSH
0.30	1.05	DELAY					POWER TROUBLE (N.S.P.C. OUTAGE)
1.05	1.30	MINING		0.80	3-8,13-24	13000	COMPLETED PUSH
1.30	1.42	RING INSTALLATION	830				
1.42	2.32	MINING		1.50	3,4,13-24	12000	-
2.32	2.45	RING INSTALLATION	831				
2.45	3.00	MINING		-	-	-	INCOMPLETE PUSH
3.00	3.15	DELAY					POWER TRIPPED OFF (100 H.P. BOOST PUMP)
3.15	3.20	MINING		-	-	-	INCOMPLETE PUSH
3.20	3.35	DELAY					POWER TRIPPED OFF (100 H.P. BOOST PUMP)
3.35	4.10	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
4.10	4.25	RING INSTALLATION	832				
4.25	4.55	LUNCH					
4.55	5.45	MINING		1.50	3-8,13-24	12000	-
5.45	6.00	RING INSTALLATION	833				
6.00	6.55	MINING		1.50	3-8,13-24	12000	-
6.55	7.10	RING INSTALLATION	834				
7.10	7.45	MINING		0.75	3,4,11-24	12000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGE CUTTERS #24,30,42A,43B. PINNED RING #832 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.45	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.20	DELAY					SCNDRY CONVEYOR DOWN(CABLE UNATTACHED)
17.20	17.50	MINING		0.75	1-4,13-24	14000	COMPLETED PUSH
17.50	18.00	RING INSTALLATION	835				
18.00	18.55	MINING		1.50	9-24	14000	-
18.55	19.05	RING INSTALLATION	836				
19.05	20.00	MINING		1.50	9-24	14000	-
20.00	20.30	LUNCH					
20.30	20.45	RING INSTALLATION	837				
20.45	21.40	MINING		1.50	9-24	14000	-
21.40	21.52	RING INSTALLATION	838				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 09,1984
Chainage :Start 1290.70 m
End 1306.25 m
Advance for day 15.55 m

File Name: DY05-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.52	22.46	MINING		1.50	1-24	14000	-
22.46	22.56	RING INSTALLATION	839				
22.56	23.45	MINING		1.25	1-4,13-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 10,1984 File Name: DY05-10A
Chainage :Start 1306.25 m
End 1321.40 m Project No: 831-6014
Advance for day 15.15 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.30	MINING		0.25	3,4,12-24	15000	COMPLETED PUSH
0.30	0.45	RING INSTALLATION	840				
0.45	1.38	MINING		1.50	3,4,12,24	15000	-
1.38	1.52	RING INSTALLATION	841				
1.52	2.48	MINING		1.50	3-8,12-24	13000	-
2.48	3.00	RING INSTALLATION	842				
3.00	3.10	DELAY					SECURED VENT TUBE ON SCRUBBER
3.10	4.05	MINING		1.50	3-8,12-24	13000	-
4.05	4.20	RING INSTALLATION	843				
4.20	4.50	LUNCH					
4.50	5.15	MINING		-	-	-	INCOMPLETE PUSH
5.15	5.30	DELAY					INSTALL MESH AND LAGGING
5.30	6.00	MINING		1.50	3-8,12-24	13000	COMPLETED PUSH
6.00	6.18	RING INSTALLATION	844				
6.18	7.15	MINING		1.50	3,4,12-24	13000	-
7.15	7.30	RING INSTALLATION	845				
7.30	7.45	MINING		0.35	3,4,12-24	13000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGE CUTTERS #31,37,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.25	MAINTENANCE	-	-	-	-	REPLACE 4 BROKEN BOLTS ON #3 CUTTER ASSORTED MACHINE MAINTENANCE
15.25	16.25	-- SHIFT CHANGE------					WALK TO FACE
16.25	17.10	MINING		1.15	3,4,9-24	13000	COMPLETED PUSH
17.10	17.25	RING INSTALLATION	846				
17.25	18.26	MINING		1.50	3,4,9-24	13000	-
18.26	18.50	RING INSTALLATION	847				
18.50	20.00	MINING		1.50	3,4,9-24	13000	-
20.00	20.30	LUNCH					
20.30	20.45	RING INSTALLATION	848				
20.45	21.57	MINING		1.50	3,4,9-24	13000	-
21.57	22.08	RING INSTALLATION	849				
22.08	22.20	MINING		-	-	-	INCOMPLETE PUSH
22.20	22.30	DELAY					STOP WORK FOR BLAST

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 10,1984
Chainage :Start 1306.25 m
End 1321.40 m
Advance for day 15.15 m

File Name: DY05-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.30	23.20	MINING — SHIFT CHANGE------		1.40	3,4,9-24	13000	COMPLETED PUSH CRAWL TO SURFACE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date MAY 11,1984 File Name: DY05-11A
Chainage :Start 1321.40 m
End 1335.00 m Project No: 831-6014
Advance for day 13.60 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.25	-- SHIFT CHANGE------					
0.25	0.35	MINING		0.10	3,4,11-24	13000	COMPLETED PUSH
0.35	0.50	RING INSTALLATION	850				
0.50	1.45	MINING		1.50	3,4,11-24	13000	-
1.45	2.00	RING INSTALLATION	851				
2.00	2.55	MINING		1.50	3,4,7,8,13-24	13000	-
2.55	3.10	RING INSTALLATIUN	852				
3.10	4.10	MINING		1.50	3,4,7,8,13-24	15000	-
4.10	4.25	RING INSTALLATION	853				
4.25	4.55	LUNCH					
4.55	5.50	MINING		1.50	3,4,7,8,12, 16-24	15000	-
5.50	6.05	RING INSTALLATION	854				
6.05	6.50	MINING		-	-	-	INCOMPLETE PUSH
6.50	7.10	DELAY					SECONDARY BELT SLIPPING
7.10	7.20	MINING		1.50	3,4,7,8,12, 16-24	15000	COMPLETED PUSH
7.20	8.20	-- SHIFT CHANGE------					
8.20	12.00	RING INSTALLATION	855				
		MAINTENANCE		-	-	-	CHANGED CUTTERS @17,23,26,33,42,43. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE					CONTINUE CHANGING CUTTERS
14.00	15.15	DELAY		-	-	-	PRIMARY CONVEYOR WOULD NOT START
15.15	15.25	MINING		0.20	3,4,13-24	13000	INCOMPLETE PUSH
15.25	16.20	-- SHIFT CHANGE------					
16.20	17.08	MINING		-	-	-	INCOMPLETE PUSH
17.08	17.17	DELAY					MAIN CONVEYOR TRIPPED OUT
17.17	17.22	MINING		1.30	3,4,13-24	13000	COMPLETED PUSH
17.22	17.35	RING INSTALLATION	856				
17.35	18.35	MINING		1.50	3-8,13-24	13000	-
18.35	18.50	RING INSTALLATION	857				
18.50	19.10	MINING		-	-	-	INCOMPLETE PUSH
19.10	20.00	DELAY					LOWER L-240 DRIVE NON OPERATIONAL
20.00	20.30	LUNCH					
20.30	21.30	DELAY					EXAMINING LOWER L-240 DRIVE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date MAY 11,1984
Chainage :Start 1321.40 m
End 1335.00 m
Advance for day 13.60 m

File Name: DY05-11A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
21.30	22.05	MINING		1.50	3-8,13-24	13000	COMPLETED PUSH
22.05	22.20	RING INSTALLATION	858				
22.20	23.20	MINING		1.50	3-8,13-24	13000	-
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 12,1984
Chainage :Start 1335.00 m
End 1340.90 m
Advance for day 5.90 m

File Name: DY05-12A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.25	-- SHIFT CHANGE------					
0.25	2.33	DELAY		-	-	-	NO COMPRESSED AIR, PULLED MATERIAL TO SKID AND UNLOADED.
		RING INSTALLATION	B59				
2.33	3.20	MINING		1.50	3,4,7,8,12-24	11000	-
3.20	3.35	RING INSTALLATION	B60				
3.35	4.05	LUNCH					
4.05	4.55	MINING		1.50	3,4,11-24	11000	-
4.55	5.10	RING INSTALLATION	B61				
5.10	6.05	MINING		1.50	3,4,7,8,12-24	12000	-
6.05	6.20	RING INSTALLATION	B62				
6.20	6.30	DELAY					NO. 1 CONVEYOR BELT TORN AT SPLICE
6.30	7.20	MINING		1.50	3,4,13-24	12000	-
		-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NAY 14,1984
Chainage :Start 1340.90 m
End 1350.70 m
Advance for day 9.80 m

File Name: DY05-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #13,32,34,42#,43A. RESPLICED NO.1 CONVEYOR BELT ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.30	MAINTENANCE					CONTINUE CHANGING CUTTERS
13.30	13.45	RING INSTALLATION	863				
13.45	14.47	MINING		1.50	3,4,13-24	12000	-
14.47	14.59	RING INSTALLATION	864				
14.59	15.38	MINING		1.05	3,4,13-24	12000	INCOMPLETE PUSH
15.38	15.45	DELAY					SECONDARY CONVEYOR SLIPPING
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.40	MINING		0.45	3,4,7,8,13-24	10000	COMPLETED PUSH
16.40	17.30	RING INSTALLATION	865				
		DELAY					AIR SHUT OFF TO EXTEND PIPELINE, WATER BUILDUP AT T.B.M., HAD TO BE PUMPED.
17.30	18.30	MINING		1.50	3,4,7,8,11-24	10000	-
18.30	18.40	RING INSTALLATION	866				
18.40	19.30	MINING		1.50	3,4,7,8,11-24	12500	-
19.30	19.45	RING INSTALLATION	867				
19.45	20.15	LUNCH					
20.15	21.05	MINING		1.50	3,4,7,8,11-24	13000	-
21.05	21.20	RING INSTALLATION	868				
21.20	22.50	MINING		1.50	3,4,7,8,12-24	13000	-
22.50	23.05	RING INSTALLATION	869				
23.05	23.45	MINING		0.80	3,4,7,8,12-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date MAY 15,1984
Chainage :Start 1350.70 m
End 1367.90 m
Advance for day 17.20 m

File Name: DY05-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.50	MINING		0.70	3-8,12-24	12000	COMPLETED PUSH
0.50	1.00	RING INSTALLATION	870				
1.00	1.53	MINING		1.50	3-8,12-24	12000	-
1.53	2.12	RING INSTALLATION	871				
2.12	3.10	MINING		1.50	3-8,12-24	12000	-
3.10	3.30	RING INSTALLATION	872				
3.30	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.05	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
5.05	5.16	RING INSTALLATION	873				
5.16	6.10	MINING		1.50	3-8,12-24	12000	-
6.10	6.23	RING INSTALLATION	874				
6.23	7.15	MINING		1.50	3-8,12-24	13000	-
7.15	7.25	RING INSTALLATION	875				
7.25	7.45	MINING		0.40	3-8,12-24	12000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS 025,41,42B,43A. REPLACED TORN PRIMARY CONVEYOR BELT ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.15	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
15.15	15.18	MINING		-	-	-	INCOMPLETE PUSH
15.18	15.45	DELAY					T.B.M. HYDRAULIC HOSE SEVERED
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.45	MAINTENANCE	-	-	-	-	END HYDRLC. HOSE REPAIR(01 DRIVE MOTOR)
16.45	17.23	MINING		1.10	3,4,7,8,12, 16-24	12000	COMPLETED PUSH
17.23	17.35	RING INSTALLATION	876				
17.35	17.45	MAINTENANCE	-	-	-	-	ADJUSTED CHUTE FLARES(SECONDARY BELT)
17.45	18.35	MINING		1.50	3,4,7,8,11, 16-24	12000	-
18.35	18.50	RING INSTALLATION	877				
18.50	19.40	MINING		1.50	3,4,7,8,16-24	12000	-
19.40	19.55	RING INSTALLATION	878				
19.55	20.25	LUNCH					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 15,1984
Chainage :Start 1350.70 m
End 1367.90 m
Advance for day 17.20 m

File Name: DY05-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.25	21.23	MINING		1.50	3,4,11-24	12000	-
21.23	21.35	RING INSTALLATION	879				
21.35	22.20	MINING		1.50	3,4,7,8,11-24	12000	-
22.20	22.35	RING INSTALLATION	880				
22.35	23.25	MINING		1.50	3,4,11-24	12000	-
23.25	23.45	RING INSTALLATION	881				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 16,1984 File Name: DY05-16A
Chainage :Start 1367.90 m
End 1386.15 m Project No: 831-6014
Advance for day 18.25 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.05	MINING		1.50	3-8,13-24	12000	-
1.05	1.15	RING INSTALLATION	882				
1.15	2.04	MINING		1.50	3-8,13-24	12000	-
2.04	2.15	RING INSTALLATION	883				
2.15	3.04	MINING		1.50	3-8,13-24	12000	-
3.04	3.18	RING INSTALLATION	884				
3.18	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.50	MINING		1.50	3-8,13-24	13000	COMPLETED PUSH
4.50	5.00	RING INSTALLATION	885				
5.00	5.47	MINING		1.50	3-8,13-24	13000	-
5.47	5.56	RING INSTALLATION	886				
5.56	7.00	MINING		1.50	3-8,13-24	14000	INSTALL MESH
7.00	7.12	RING INSTALLATION	887				
7.12	7.45	MINING		1.00	3-8,13-24	14000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #40,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.53	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
14.53	15.16	MINING		0.50	3,4,5-8,17-24	13000	COMPLETED PUSH
15.16	15.30	RING INSTALLATION	888				
15.30	15.35	MINING		0.10	-	-	INCOMPLETE PUSH
15.35	15.45	DELAY					NO WATER SPRAY INSIDE HEAD, PRIME PUMP.
15.45	16.10	DELAY	-	-	-	-	LOAD STRUTS ON TRIP (AT SURFACE)
16.10	16.25	-- SHIFT CHANGE------					
16.25	17.12	MINING		1.40	3,4,13-24	13000	COMPLETED PUSH
17.12	17.24	RING INSTALLATION	889				
17.24	18.13	MINING		1.50	3,4,13-24	13000	-
18.13	18.30	RING INSTALLATION	890				
18.30	19.30	MINING		1.50	3,4,7,8,12-24	13000	-
19.30	19.45	RING INSTALLATION	891				
19.45	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.10	MINING		1.50	3,4,7,8,12-24	12000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 16,1984
Chainage :Start 1367.90 m
End 1386.15 m
Advance for day 18.25 m

File Name: DY05-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.10	21.20	RING INSTALLATION	892				
21.20	22.18	MINING		1.50	3-8,12-24	12000	-
22.18	22.30	RING INSTALLATION	893				
22.30	22.40	MINING		0.25	3,4,7,8,12-24	12000	INCOMPLETE PUSH
22.40	23.45	MAINTENANCE					REPLACE BROKEN HYDRLC HOSE(SUPPLY HOSE TO NO. 3 MAIN DRIVE MOTOR)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: MAY 17,1984
Chainage: Start 1386.15 m
End 1403.90 m
Advance for day 17.75 m

File Name: DY05-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	2.20	MAINTENANCE	-	-	-	-	END HYDRLC. HOSE REPAIR(#3 DRIVE MOTOR)
2.20	3.05	MINING		1.25	3-8,12-24	10000	COMPLETED PUSH
3.05	3.16	RING INSTALLATION	894				
3.16	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.36	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
4.36	4.48	RING INSTALLATION	895				
4.48	5.40	MINING		1.50	3-8,12-24	12000	-
5.40	5.50	RING INSTALLATION	896				
5.50	6.20	MINING		-	-	-	INCOMPLETE PUSH
6.20	6.30	DELAY					MAIN BELT TRIPPED OFF
6.30	6.50	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
6.50	7.00	RING INSTALLATION	897				
7.00	7.45	MINING		1.25	3-8,12-24	12000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #21,29,32,36,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.09	MAINTENANCE	-	-	-	-	CONTINUE CHANGING CUTTERS ASSORTED MACHINE MAINTENANCE
14.09	14.18	MINING		0.25	3-8,13-24	10000	COMPLETED PUSH
14.18	14.32	RING INSTALLATION	898				
14.32	15.06	MAINTENANCE	-	-	-	-	CHECK SEALS ON T.B.M.
15.06	15.45	MINING		0.90	3-8,13-24	9-10000	INCOMPLETE PUSH
15.45	16.00	-- SHIFT CHANGE------					
16.00	16.10	DELAY					LOAD STRUTS ON TRIP (AT SURFACE)
16.10	16.25	-- SHIFT CHANGE------					
16.25	16.48	MINING		0.60	3,4,7,8,12-24	10000	COMPLETED PUSH
16.48	17.00	RING INSTALLATION	899				
17.00	17.53	MINING		1.50	3,4,7,8,12-24	12000	-
17.53	18.05	RING INSTALLATION	900				
18.05	18.55	MINING		1.50	3,4,7,8,12-24	12000	-
18.55	19.05	RING INSTALLATION	901				
19.05	19.55	MINING		1.50	3,4,7,8,11,13, 17-24	11000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 17,1984
Chainage :Start 1386.15 m
End 1403.90 m
Advance for day 17.75 m

File Name: DY05-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.55	20.10	RING INSTALLATION	902				
20.10	20.40	LUNCH					
20.40	21.35	MINING		1.50	3,4,7,8,13,15,17-24	12000	-
21.35	21.50	RING INSTALLATION	903				
21.50	22.42	MINING		1.50	3,4,7,8,11,13,15,17-24	12000	-
22.42	22.55	RING INSTALLATION	904				
22.55	23.45	MINING		1.50	3,4,7,8,11,13,15,17-24	12000	-
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 18,1984 File Name: DY05-1BA
Chainage :Start 1403.90 m
End 1420.40 m Project No: 831-6014
Advance for day 16.50 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.35	RING INSTALLATION	905				
0.35	1.25	MINING		1.50	3-8,12-24	14000	-
1.25	1.35	RING INSTALLATION	906				
1.35	2.23	MINING		1.50	3-8,12-24	14000	-
2.23	2.30	RING INSTALLATION	907				
2.30	3.18	MINING		1.50	3-8,12-24	14000	-
3.18	3.28	RING INSTALLATION	908				
3.28	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.50	MINING		1.50	3-8,12-24	14000	COMPLETED PUSH
4.50	5.02	RING INSTALLATION	909				
5.02	6.02	MINING		1.50	3-8,12-24	14000	-
6.02	6.15	RING INSTALLATION	910				
6.15	7.45	MAINTENANCE	-	-	-	-	EXTENDING MAIN CONVEYOR
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #16,22,30,38,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.14	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
15.14	15.45	MINING		0.90	3-8,13-24	11000	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.40	MINING		0.60	3,4,7,8,13-24	11000	COMPLETED PUSH
16.40	16.50	RING INSTALLATION	911				PARTIAL INSTALLATION (16 STRUTS USED)
16.50	17.35	DELAY					WAIT FOR STRUTS TO COMPLETE #911 ARCH
17.35	17.40	RING INSTALLATION	911				COMPLETE INSTALLATION (8 STRUTS USED)
17.40	18.40	MINING		1.50	3,4,7,8,12-24	11000	-
18.40	18.55	RING INSTALLATION	912				
18.55	19.40	MINING		1.50	3,4,7,8,12-24	15000	-
19.40	19.55	RING INSTALLATION	913				
19.55	20.25	LUNCH					
20.25	21.18	MINING		1.50	3,4,7,8,12-24	15000	-
21.18	21.30	RING INSTALLATION	914				
21.30	22.22	MINING		1.50	3,4,7,8,12-24	15000	-
22.22	22.36	RING INSTALLATION	915				
22.36	23.30	MINING		1.50	3,4,7,8,12-24	15000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY05-18A

Date MAY 18,1984
Chainage :Start 1403.90 m
End 1420.40 m
Advance for day 16.50 m

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.30	23.45	RING INSTALLATION -- SHIFT CHANGE	916				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 19,1984
Chainage :Start 1420.40 m
End 1427.90 m
Advance for day 7.50 m

File Name: DY05-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.50	MINING		-	-	-	INCOMPLETE PUSH
0.50	1.00	DELAY					SECONDARY CONVEYOR SHUT OFF TO EXAMINE OVERHEATING ROLLER AT BOTTOM OF BELT.
1.00	1.25	MINING		1.50	3,4,13-24	14000	COMPLETED PUSH
1.25	1.35	RING INSTALLATION	917				
1.35	2.35	MINING		1.50	3,4,13-24	15000	-
2.35	2.50	RING INSTALLATION	918				
2.50	3.41	MINING		1.50	3,4,13-24	15000	-
3.41	4.00	RING INSTALLATION	919				
4.00	4.30	LUNCH & MAINTENANCE					REPLACED SECONDARY CONVEYOR ROLLER (AS DESCRIBED ABOVE)
4.30	4.40	DELAY					MAIN BELT TRIPPING OUT
4.40	5.40	MINING		1.50	3,4,13-24	15000	-
5.40	5.50	RING INSTALLATION	920				
5.50	7.05	MINING		1.50	3,4,13-24	15000	-
7.05	7.45	MAINTENANCE					CLEAN UP OF T.B.M. AND SKID
		-- SHIFT CHANGE------					WEEKEND, NO WORK UNTIL MAY 28/84

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 28,1984
Chainage :Start 1427.90 m
End 1433.27 m
Advance for day 5.37 m

File Name: DY05-2BA

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	10.00	MAINTENANCE	-	-	-	-	REMOVING DRILLING EQUIPMENT FROM T.B.M.
		RING INSTALLATION	921				CLEAN MUCK & WATER FROM T.B.M. HEAD
10.00	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #9,39,43A.
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.30	MAINTENANCE & DELAY	-	-	-	-	CONTINUE CHANGING CUTTERS
							BROKEN BOLTS IN CENTRE CUTTER UNIT
15.30	15.45	MINING		-	3-24	10000	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.05	MINING		-	-	-	INCOMPLETE PUSH (HIGH PRESSURE, LOW
							PENETRATION)
17.05	17.21	DELAY					INSTALL MESH AND LAGGING
17.21	17.56	MINING		-	-	-	INCOMPLETE PUSH
17.56	18.14	DELAY					INSTALL MESH AND LAGGING
18.14	18.21	MINING		1.30	1-24	15000	COMPLETED PUSH
18.21	18.39	RING INSTALLATION	922				
18.39	19.43	MINING		1.50	3,4,7,8,11-20	15000	-
19.43	20.02	RING INSTALLATION	923				
20.02	20.32	LUNCH					
20.32	21.46	MINING		-	-	-	INCOMPLETE PUSH
21.46	21.58	RING INSTALLATION	924				PARTIAL INSTALLATION
21.58	22.07	MINING		1.50	3,4,7,8,11-20	15000	COMPLETED PUSH
22.07	22.19	RING INSTALLATION	924				COMPLETE INSTALLATION
22.19	22.51	MINING		0.80	3-8,11-20	15000	INCOMPLETE PUSH
22.51	23.45	DELAY					REPLACE BROKEN HYDRLC HOSE(SUPPLY HOSE
							TO NO. 5 CUTTING HEAD PUMP)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 29,1984
Chainage :Start 1433.27 m
End 1447.47 m
Advance for day 14.20 m

File Name: DY05-29A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.55	DELAY	-	-	-	-	END HYDRLC. HOSE REPAIR (SUPPLY HOSE TO NO. 5 CUTTING HEAD PUMP)
0.55	1.30	MINING		0.60	3-8,11-24	15000	INCOMPLETE PUSH
1.30	3.25	DELAY					REPLACE BROKEN HYDRLC. HOSE(SUPPLY HOSE TO NO. 8 CUTTING HEAD PUMP)
3.25	3.35	MINING		0.10	3-8,11-24	15000	COMPLETED PUSH
3.35	4.05	LUNCH					
4.05	4.25	RING INSTALLATION	925				
4.25	4.50	MINING		-	-	-	INCOMPLETE PUSH
4.50	5.03	DELAY					INSTALL MESH AND LAGGING
5.03	5.47	MINING		1.50	3-8,11-24	15000	COMPLETED PUSH
5.47	6.11	RING INSTALLATION	926				
6.11	6.30	MINING		-	-	-	INCOMPLETE PUSH
6.30	6.40	DELAY					INSTALL MESH AND LAGGING
6.40	7.20	MINING		1.50	3-8,16-24	15000	COMPLETED PUSH
7.20	7.30	RING INSTALLATION	927				
7.30	7.45	MINING		0.20	3-8,16-24	15000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #20,35
12.00	12.30	LUNCH					
12.30	14.10	MAINTENANCE		-	-	-	CONTINUED TO CHANGE CUTTERS ASSORTED MACHINE MAINTENANCE
14.10	15.10	MINING		1.30	3-24	15000	COMPLETED PUSH
15.10	15.20	RING INSTALLATION	928				
15.20	15.45	MINING		0.70	3-24	15000	INCOMPLETE PUSH
15.45	16.22	-- SHIFT CHANGE------					
16.22	16.32	MINING		-	-	-	INCOMPLETE PUSH
16.32	16.43	DELAY					PRIMED PUMP FOR WATER SUPPLY IN HEAD
16.43	17.03	MINING		0.80	3-8,11-16, 21-24	13-15000	COMPLETED PUSH
17.03	17.18	RING INSTALLATION	929				
17.18	18.06	MINING		1.50	3-8,11,13-24	15000	-
18.06	18.20	RING INSTALLATION	930				
18.20	18.34	DELAY					NO WATER FOR WATER SPRAY IN HEAD
18.34	19.30	MINING		1.50	3-8,11,13-24	14000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date MAY 29,1984
Chainage :Start 1433.27 m
End 1447.47 m
Advance for day 14.20 m

File Name: DY05-29A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.30	19.46	RING INSTALLATION	931				
19.46	19.58	MINING		-	-	-	INCOMPLETE PUSH
19.58	20.30	LUNCH					
20.30	21.21	MINING		1.50	3-8,11,13-24	14000	COMPLETED PUSH
21.21	21.34	RING INSTALLATION	932				
21.34	21.58	MINING		-	-	-	INCOMPLETE PUSH
21.58	22.07	DELAY					CHUTE PLUGGED
22.07	22.26	MINING		1.50	3-8,11,13-24	15000	COMPLETED PUSH
22.26	22.39	RING INSTALLATION	933				
22.39	23.29	MINING		1.50	3-5,7,11,13-24	14000	-
23.29	23.44	RING INSTALLATION	934				
23.44	0.00	— SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 30,1984 File Name: DY05-30A
Chainage :Start 1447.47 m
End 1464.97 m Project No: 831-6014
Advance for day 17.50 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.50	DELAY		-	-	-	REPLACE BELT STRUCTURE #2 CONVEYOR
0.50	1.45	MINING		1.50	3-8'11-24	15000	-
1.45	1.57	RING INSTALLATION	935				
1.57	2.30	MINING		0.60	-	-	INCOMPLETE PUSH
2.30	3.12	DELAY					REPLACE BELT STRUCTURE #2 CONVEYOR
3.12	3.43	MINING		0.90	3-8,11-24	15000	COMPLETED PUSH
3.43	3.55	RING INSTALLATION	936				
3.55	4.25	LUNCH					
4.25	5.18	MINING		1.50	3-8,11-24	12000	-
5.18	5.30	RING INSTALLATION	937				
5.30	6.30	MINING		1.50	3-8,11-24	12000	-
6.30	6.43	RING INSTALLATION	938				
6.43	7.45	MINING		1.50	3,4,13-24	15000	-
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE					CHANGED CUTTER #16 ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.45	MAINTENANCE		-	-	-	REPLACE TORN SECTION OF PRIMARY CONVEYOR BELT
14.45	15.00	RING INSTALLATION	939				
15.00	15.45	MINING		0.80	3,4,13-24	15000	INCOMPLETE PUSH
15.45	16.17	-- SHIFT CHANGE------					
16.17	16.43	MINING		0.70	-	-	COMPLETED PUSH
16.43	16.57	RING INSTALLATION	940				
16.57	17.46	MINING		1.50	3-8,17-24	14000	-
17.46	17.54	RING INSTALLATION	941				
17.54	18.50	MINING		1.50	3-8,17-24	14000	-
18.50	19.01	RING INSTALLATION	942				
19.01	19.42	MINING		-	-	-	INCOMPLETE PUSH
19.42	19.46	DELAY		-	-	-	POWER KICKED OFF
19.46	19.58	MINING		-	-	-	INCOMPLETE PUSH
19.58	20.28	LUNCH					
20.28	20.36	MINING		1.50	3-8,13-24	10500	COMPLETED PUSH
20.36	20.50	RING INSTALLATION	943				
20.50	21.58	RING INSTALLATION		1.50	3,4,8,13-24	10000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 30,1984 File Name: DY05-30A
Chainage :Start 1447.47 m
End 1464.97 m Project No: 831-6014
Advance for day 17.50 m

Time (hours)		Activity	Ring	Advance	Push Cylinder		Comments
Start	End		No.	(m)	In use	Pressure (kPa)	
21.58	22.10	RING INSTALLATION	944				
22.10	22.57	MINING		1.50	3,4,8,13-24	13000	-
22.57	23.09	RING INSTALLATION	945				
23.09	23.45	MINING		1.00	3,4,8,13-24	13000	INCOMPLETE PUSH
23.45	0.00	-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 31,1984 File Name: DY05-31A
Chainage :Start 1464.97 m
End 1483.47 m Project No: 831-6014
Advance for day 18.50 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	— SHIFT CHANGE------					
0.15	0.35	MINING		0.50	3,4,13-24	15000	COMPLETED PUSH
0.35	0.50	RING INSTALLATION	946				
0.50	1.55	MINING		1.50	3,4,13-24	15000	-
1.55	2.05	RING INSTALLATION	947				
2.05	3.00	MINING		1.50	3,4,13-24	15000	-
3.00	3.12	RING INSTALLATION	948				
3.12	4.00	MINING		1.50	3-8,13-24	15000	-
4.00	4.15	RING INSTALLATION	949				
4.15	4.45	LUNCH					
4.45	5.35	MINING		1.50	3-8,13-24	15000	-
5.35	5.45	RING INSTALLATION	950				
5.45	6.54	MINING		1.50	3-8,11,12 16-24	10000	-
6.54	7.07	RING INSTALLATION	951				
7.07	7.45	MINING		0.75	3-8,11,12, 16-24	10000	-
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED CUTTER #16
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE		-	-	-	INSPECT T.B.M. SEAL AREA
14.00	14.08	MINING		-	-	-	INCOMPLETE PUSH
14.08	14.11	DELAY					NO WATER
14.11	14.30	MINING		0.75	3,4,7,8,11,12, 17-24	14000	COMPLETED PUSH
14.30	14.43	RING INSTALLATION	952				
14.43	15.03	MINING		-	-	-	INCOMPLETE PUSH
15.03	15.17	DELAY					INSTALL MESH
15.17	15.23	MINING		0.98	3,4,7,8,11,12, 17-24	125000	INCOMPLETE PUSH
15.23	15.45	DELAY		-	-	-	ELECTRICAL DELAY G.E.B. TRIPPED
15.45	16.16	— SHIFT CHANGE------					
16.16	16.32	MINING		0.52	-	9500	COMPLETED PUSH
16.32	16.44	RING INSTALLATION	953				
16.44	17.10	MINING		-	-	-	INCOMPLETE PUSH
17.10	17.18	DELAY					INSTALL MESH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date MAY 31,1984
Chainage :Start 1464.97 m
End 1483.47 m
Advance for day 18.50 m

File Name: DY05-31A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.18	17.40	MINING		1.50	3-8,10,12, 17-24	9500	COMPLETED PUSH
17.40	17.51	RING INSTALLATION	954				
17.51	18.10	MINING		-	-	-	INCOMPLETE PUSH
18.10	18.16	DELAY					INSTALL MESH
18.16	18.45	MINING		1.50	3-8,10,12, 17-24	9500	COMPLETED PUSH
18.45	18.59	RING INSTALLATION	955				
18.59	19.24	MINING		-	-	-	INCOMPLETE PUSH
19.24	19.32	DELAY					INSTALL MESH
19.32	19.50	MINING		1.50	3-8,10,12, 17-24	9500	COMPLETED PUSH
19.50	20.04	RING INSTALLATION	956				
20.04	20.35	LUNCH					
20.35	20.40	RING INSTALLATION	-	-	-	-	COMPLETED RING INSTALLATION
20.40	20.45	MINING		-	-	-	INCOMPLETE PUSH
20.45	21.13	DELAY					PRIMARY CONVEYOR STOPPED
21.13	21.33	MINING		-	-	-	INCOMPLETE PUSH
21.33	21.51	DELAY					REPLACE CONVEYOR STRUCTURE BARS AND 2 ROLLERS AFTER BLAST
21.51	22.27	MINING		1.50	3-8,10,12, 17-24	9500	COMPLETED PUSH
22.27	22.43	RING INSTALLATION	957				
22.43	23.42	MINING		1.50	3-8,14,16, 17-24	8500-9500	-
23.42	0.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUME 01,1984
Chainage :Start 1483.47 m
End 1502.57 m
Advance for day 19.10 m

File Name: DY06-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	DELAY	-	-	-	-	UNLOADING BLASTING MAT AT SURFACE
0.10	0.25	-- SHIFT CHANGE------					
0.25	0.40	RING INSTALLATION	958				
0.40	1.28	MINING		1.50	3,4,13-24	9000	-
1.28	1.43	RING INSTALLATION	959				
1.43	2.40	MINING		1.50	3,4,13-24	12000	-
2.40	2.53	RING INSTALLATION	960				
2.53	3.00	MINING		-	-	-	INCOMPLETE PUSH
3.00	3.05	MAINTENANCE					CHECK HYDRAULIC HOSES
3.05	3.50	MINING		1.50	3,4,17-24	12000	COMPLETED PUSH
3.50	4.05	RING INSTALLATION	961				
4.05	4.35	LUNCH					
4.35	5.35	MINING		1.50	3,4,17-24	12000	-
5.35	5.50	RING INSTALLATION	962				
5.50	6.45	MINING		1.50	3,4,17-24	12000	-
6.45	7.00	RING INSTALLATION	963				
7.00	7.45	MINING		1.50	3,4,13-24	9000	-
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,27,29.
		RING INSTALLATION	964				REPLACE 3 HELI-COILS (CENTRE CUTTER)
12.00	12.30	LUNCH					
12.30	14.20	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
14.20	14.39	MAINTENANCE	-	-	-	-	PUTTING AWAY CUTTER TOOLS
14.39	15.16	MINING		-	-	-	INCOMPLETE PUSH
15.16	15.20	DELAY					ELECTRICAL PROBLEMS
15.20	15.28	MINING		1.45	3-8,11,12, 17-24	8000	COMPLETED PUSH
15.28	15.45	RING INSTALLATION	965				PARTIAL INSTALLATION
15.45	16.00	-- SHIFT CHANGE------					
16.00	16.10	DELAY					UNLOADING EMPTY REEL
16.10	16.23	-- SHIFT CHANGE------					
16.23	16.30	RING INSTALLATION	965				COMPLETE INSTALLATION
16.30	17.18	MINING		1.55	3,4,13-24	9500	-
17.18	17.35	DELAY					DEWATERING INVERT (TAILSKIN AREA)
17.35	17.50	RING INSTALLATION	966		17-24		
17.50	18.49	MINING		1.50	3,4,13,15,	12500	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 01,1984
Chainage :Start 1483.47 m
End 1502.57 m
Advance for day 19.10 m

File Name: DY06-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.49	18.58	RING INSTALLATION	967				
18.58	19.55	MINING		1.50	3-8,17-24	12500	-
19.55	20.00	DELAY					UNLOADING MATERIAL FROM TRIP(RING #968 AND STRUTS)
20.00	20.30	LUNCH					
20.30	20.53	RING INSTALLATION	968				
20.53	21.47	MINING		1.50	3-8,17-24	12000	-
21.47	22.00	RING INSTALLATION	969				
22.00	22.56	MINING		1.50	3-8,17-24	11000	-
22.56	23.06	RING INSTALLATION	970				
23.06	23.42	MINING		1.10	3-8,17-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkia-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUME 02,1984
Chainage :Start 1502.57 m
End 1510.35 m
Advance for day 7.78 m

File Name: DY06-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.45	MINING		0.40	3-8,17-24	10000	COMPLETED PUSH
0.45	1.00	RING INSTALLATION	971				
1.00	2.00	MINING		1.50	3-8,17-24	11000	-
2.00	2.10	RING INSTALLATION	972				
2.10	3.05	MINING		1.50	3-8,13-24	12000	-
3.05	3.17	RING INSTALLATION	973				
3.17	4.12	MINING		1.50	3-8,13-24	12000	-
4.12	4.30	RING INSTALLATION	974				
4.30	5.00	LUNCH					
5.00	5.08	MINING		-	-	-	INCOMPLETE PUSH
5.08	5.30	DELAY					NO WATER, THREADED PIPE COUPLING AT THE HOSE REEL, BACKED OFF
5.30	6.20	MINING		1.50	3-8,13-24	12000	COMPLETED PUSH
6.20	6.35	RING INSTALLATION	975				
6.35	7.30	MINING		1.50	3-8,13-24	12000	-
7.30	7.45	RING INSTALLATION	976				
7.45	8.00	-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 04,1984
Chainage :Start 1510.35 m
End 1518.35 m
Advance for day 8.00 m

File Name: DY06-04A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #31,42B,43A.
12.00	12.30	LUNCH					ASSORTED MACHINE MAINTENANCE
12.30	15.00	MAINTENANCE	-	-	-	-	REPLACE HELI-COILS ON CENTRE CUTTERS
15.00	15.15	MAINTENANCE	-	-	-	-	CLEAN UP TOOLS FOR CUTTER CHANGE
15.15	15.45	MINING		1.06	3-8,11-24	12500	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.50	MINING		0.44	3-8,11-24	15000	COMPLETED PUSH
16.50	17.05	RING INSTALLATION	977				
17.05	17.25	MINING		-	-	-	INCOMPLETE PUSH
17.25	17.45	DELAY					REPAIRED RUPTURED WATER HOSE
17.45	18.30	MINING		1.50	3-8,11-24	10000	COMPLETED PUSH
18.30	18.42	RING INSTALLATION	978				
18.42	19.28	MINING		-	-	-	INCOMPLETE PUSH
19.28	20.00	DELAY					THREADED PIPE COUPLING AT THE HOSE REEL BACKED OFF, REROUTED WATER.
20.00	20.07	MINING		1.50	3-8,11-24	15000	COMPLETED PUSH
20.07	20.20	RING INSTALLATION	979				
20.20	20.50	LUNCH					
20.50	21.50	MINING		1.50	3-8,11,12, 17-24	12000	-
21.50	22.05	RING INSTALLATION	980				
22.05	23.05	MINING		1.50	3-8,17-24	12000	-
23.05	23.20	RING INSTALLATION	981				
23.20	23.45	MINING		0.50	3,4,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 05,1984
Chainage :Start 1518.35 m
End 1522.35 m
Advance for day 4.00 m

File Name: DY06-05A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.17	-- SHIFT CHANGE------					
0.17	1.02	MINING		1.00	3,4,9-24	12500	COMPLETED PUSH
1.02	1.16	RING INSTALLATION	982				
1.16	1.45	MINING		-	-	-	INCOMPLETE PUSH
1.45	1.54	DELAY					INSTALLING SCREENING
1.54	2.00	MINING		-	-	-	INCOMPLETE PUSH
2.00	2.06	DELAY					NO WATER SPRAY INSIDE HEAD
2.06	2.40	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
2.40	2.56	RING INSTALLATION	983				
2.56	4.03	MINING		1.50	3,4,10,12-24	12500	-
4.03	4.18	RING INSTALLATION	984				
4.18	4.45	LUNCH					
4.45	7.45	MAINTENANCE					EXTENDING NO. 2 MAIN CONVEYOR BELTLINE.
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #14,30,42B. CHANGED 3 HELI-COILS FOR THE CUTTERS.
12.00	12.30	LUNCH					
12.30	13.00	MAINTENANCE	-	-	-	-	CONTINUE CHANGING CUTTERS.
13.00	14.00	MAINTENANCE	-	-	-	-	COMPLETE EXTENSION OF NO.2 MAIN CONVEYOR BELTLINE.
14.00	15.45	MAINTENANCE	-	-	-	-	HOOK UP SERVICES IN THE AREA WHERE INSTALLATION OF ROCKBOLTS IS REQUIRED.
15.45	16.15	-- SHIFT CHANGE------					
16.15	23.45	ROCKBOLT INSTALLATION		-	-	-	INSTALLED 2 ROCKBOLTS (RING #884 - 885) INSTALLED 1 ROCKBOLT (RING #885 - 886) ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUME 06,1984
Chainage :Start 1522.35 m
End 1522.35 m
Advance for day 0.00 m

File Name: DY06-06A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
0.00	0.15	-- SHIFT CHANGE------					
0.15	7.45	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 7 ROCKBOLTS (RING #886 - 887)
							ASSORTED MACHINE MAINTENANCE
7.45	8.15	-- SHIFT CHANGE------					
8.15	15.45	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 7 ROCKBOLTS (RING #887 - 888)
							INSTALLED 5 ROCKBOLTS (RING #888 - 889)
							ASSORTED MACHINE MAINTENANCE
15.45	16.15	-- SHIFT CHANGE------					
16.15	23.45	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 5 ROCKBOLTS (RING #884 - 885)
							INSTALLED 5 ROCKBOLTS (RING #885 - 886)
							INSTALLED 1 ROCKBOLT (RING #888 - 889)
							INSTALLED 4 ROCKBOLTS (RING #889 - 890)
							ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUME 07,1984 File Name: DY06-07A
Chainage :Start 1522.35 m
End 1522.35 m Project No: 831-6014
Advance for day 0.00 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	7.45	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 2 ROCKBOLTS (RING #883 - 884)
							INSTALLED 1 ROCKBOLT (RING #888 - 889)
							INSTALLED 3 ROCKBOLTS (RING #889 - 890)
							INSTALLED 7 ROCKBOLTS (RING #890 - 891)
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 4 ROCKBOLTS (RING #881 - 882)
							INSTALLED 5 ROCKBOLTS (RING #882 - 883)
12.00	12.30	LUNCH					
12.30	15.45	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 5 ROCKBOLTS (RING #883 - 884)
							ASSORTED MACHINE MAINTENANCE
15.45	16.15	-- SHIFT CHANGE------					
16.15	23.45	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 5 ROCKBOLTS (RING #883 - 884)
							INSTALLED 1 ROCKBOLT (RING #885 - 886)
							PINNED RING #883 WITH 2.4m BOLTS
							PINNED RING #884 WITH 2.4m BOLTS
							PINNED RING #885 WITH 2.4m BOLTS
							PINNED RING #886 WITH 2.4m BOLTS
							PINNED RING #887 WITH 2.4m BOLTS
							PINNED RING #888 WITH 2.4m BOLTS
							ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 08,1984
Chainage :Start 1522.35 m
End 1522.70 m
Advance for day 0.35 m

File Name: DY06-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.31	MINING		0.35	3,4,9-24	12500	INCOMPLETE PUSH
0.35	7.45	ROCKBOLT INSTALLATION AND MAINTENANCE	-	-	-	-	INSTALLED 3 ROCKBOLTS (RING #905 - 906) INSTALLED 3 ROCKBOLTS (RING #906 - 907) INSTALLED 2 ROCKBOLTS (RING #907 - 908) INSTALLED 2 ROCKBOLTS (RING #908 - 909) PINNED RING #889 WITH 2.4m BOLTS PINNED RING #890 WITH 2.4m BOLTS ASSORTED MACHINE MAINTENANCE
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	ROCKBOLT INSTALLATION	-	-	-	-	INSTALLED 1 ROCKBOLT (RING #905 - 906) INSTALLED 1 ROCKBOLT (RING #906 - 907) INSTALLED 2 ROCKBOLTS (RING #907 - 908) PINNED RING #905 WITH 2.4m BOLTS PINNED RING #906 WITH 2.4m BOLTS PINNED RING #907 WITH 2.4m BOLTS
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE	-	-	-	-	ASSORTED MACHINE MAINTENANCE
15.40	16.15	-- SHIFT CHANGE------					
16.15	23.45	ROCKBOLT INSTALLATION AND MAINTENANCE -- SHIFT CHANGE------	-	-	-	-	INSTALLED 2 ROCKBOLTS (RING #908 - 909) INSTALLED 4 ROCKBOLTS (RING #909 - 910) INSTALLED 3 ROCKBOLTS (RING #910 - 911) ASSORTED MACHINE MAINTENANCE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 0 2)

Date JUME 09,1984 File Name: DY06-09A
Chainage :Start 1522.70 m
End 1522.70 m Project No: 831-6014
Advance for day 0.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	8.00	ROCKBOLT INSTALLATION AND MAINTENANCE	-	-	-	-	INSTALLED 1 ROCKBOLT (RING 0910 - 911) PINNED RING 0908 WITH 2.4m BOLTS PINNED RING 0909 WITH 2.4m BOLTS PINNED RING 0910 WITH 2.4m BOLTS PINNED RING 0911 WITH 2.4m BOLTS ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 12,1984 File Name: DY06-12A
Chainage :Start 1522.70 m
End 1533.25 m Project No: 831-6014
Advance for day 10.55 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	9.00	MAINTENANCE		-	-	-	CHECKED BELTS
9.00	9.15	MAINTENANCE					READING T.B.M.
9.15	10.07	MINING		1.15	3-8,13-24	12000	FULL PUSH
10.07	10.22	RING INSTALLATION	985				
10.22	10.45	MINING		-	-	-	INCOMPLETE PUSH
10.45	10.50	DELAY					INSTALL MESH
10.50	11.25	MINING		1.50	1,3,6,14,18, 19,22	14000	COMPLETED PUSH
11.25	11.39	RING INSTALLATION	986				
11.39	12.03	MINING		-	-	-	INCOMPLETE PUSH
12.03	12.08	DELAY					INSTALL MESH
12.08	12.30	MINING		-	-	-	INCOMPLETE PUSH
12.30	12.35	DELAY					SECONDARY BELT STOPPAGE
12.35	12.55	MINING		-	-	-	INCOMPLETE PUSH
12.55	13.00	DELAY		-	-	-	MOTOR FAILURE
13.00	13.04	MINING		1.50	1,2,4,5,6,13, 17,18,22	12500	COMPLETED PUSH
13.04	13.19	RING INSTALLATION	987				
13.19	13.50	LUNCH					
13.50	14.32	MINING		-	-	-	INCOMPLETE PUSH
14.32	14.47	DELAY					RING BOLTS FOR RING #986 BROKE AND REPLACED TWICE, CAUSED BY EXPANDABLE SEGMENT IN THE INVERT.
14.47	15.03	MINING		1.50	1,2,4,5,6,13, 17,18,22.	13000	COMPLETED PUSH
15.03	15.45	DELAY		-	-	-	ROTATED RING SEGMENT(WAS IN INVERT FOR RING #987 AND POSITIONED IT ON TOP
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.40	RING INSTALLATION	988				
16.40	17.50	MINING		-	-	-	INCOMPLETE PUSH
17.50	19.19	DELAY					INSTALLED FILLER PIECE IN RING #986 VISUAL INSPECTION AND WAIT FOR MATERIAL FROM SURFACE.
19.19	20.00	MINING		1.50	3-8,10,12,13-24	8000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 12,1984
Chainage :Start 1522.70 m
End 1533.25 m
Advance for day 10.55 m

File Name: DY06-12A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
20.00	20.18	RING INSTALLATION	989				
20.18	20.38	LUNCH					
20.38	21.54	MINING		1.50	3,4,10,13-24	12000	-
21.54	22.10	RING INSTALLATION	990				
22.10	23.18	MINING		1.50	3,4,10,13-24	13000	-
23.18	23.27	RING INSTALLATION	991				
23.27	23.44	MINING		0.40	-	-	INCOMPLETE PUSH
23.44	0.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel B 2)

Date JUNE 13,1984
Chainage :Start 1533.25 m
End 1550.05 m
Advance for day 16.80 m

File Name: DY06-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.10	MINING		1.10	3-8,11-24	13000	COMPLETED PUSH
1.10	1.25	RING INSTALLATION	992				
1.25	1.55	MINING		-	-	-	INCOMPLETE PUSH
1.55	2.05	DELAY					INSTALL MESH
2.05	2.45	MINING		1.50	3,4,7,8,11-24	13000	COMPLETED PUSH
2.45	3.00	RING INSTALLATION	993				
3.00	3.45	MINING		-	-	-	INCOMPLETE PUSH
3.45	3.55	DELAY					INSTALL MESH
3.55	4.05	MINING		-	-	-	INCOMPLETE PUSH
4.05	4.35	LUNCH					
4.35	4.45	MINING		1.50	3,4,7,8,11-16, 21-24	15000	COMPLETED PUSH
4.45	5.00	RING INSTALLATION	994				
5.00	5.30	MINING		-	-	-	INCOMPLETE PUSH
5.30	5.40	DELAY					INSTALL MESH
5.40	6.18	MINING		1.50	3,4,7,8,11-24	13000	COMPLETED PUSH
6.18	6.33	RING INSTALLATION	995				
6.33	6.55	MINING		-	-	-	INCOMPLETE PUSH
6.55	7.05	DELAY					SECONDARY BELT KICKED OFF
7.05	7.45	MINING		1.15	3,4,7,8,11-24	15000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #12,42. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.55	MAINTENANCE	-	-	-	-	CONTINUE CHANGING CUTTERS
13.55	14.15	MINING		0.35	1,2,4,5,9,10, 13,14,17,18,21, 22	16000	COMPLETED PUSH
14.15	14.30	RING INSTALLATION	996				
14.30	15.37	MINING		1.50	1,4,5,6,9,13, 14,17,18,21,24	13500	-
15.37	15.42	RING INSTALLATION	997				PARTIAL INSTALLATION
15.42	16.15	-- SHIFT CHANGE------					
16.15	16.24	RING INSTALLATION	997				COMPLETE INSTALLATION
16.24	16.45	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUME 13,1984 File Name: DY06-13A
Chainage :Start 1533.25 m
End 1550.05 m Project No: 831-6014
Advance for day 16.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.45	16.53	DELAY					INSTALL MESH
16.53	17.28	MINING		1.50	3,4,6,8,11, 13-24	12500	COMPLETED PUSH
17.28	17.38	RING INSTALLATION	998				
17.38	18.39	MINING		1.50	3-8,11-24	11000	-
18.39	18.53	RING INSTALLATION	999				
18.53	18.58	DELAY					NO POWER TO T.B.M.
18.58	19.29	MINING		-	-	-	INCOMPLETE PUSH
19.29	19.34	DELAY					INSTALL MESH
19.34	19.58	MINING		1.50	3-8,11-24	11500	COMPLETED PUSH
19.58	20.28	LUNCH					
20.28	20.40	RING INSTALLATION	1000				
20.40	21.02	MINING		-	-	-	INCOMPLETE PUSH
21.02	21.12	DELAY					SECONDARY BELT LOCKED OUT (FAULTY SEQUENCE ROLLER)
21.12	21.52	MINING		1.50	3-8,11-24	12000	COMPLETED PUSH
21.52	22.04	RING INSTALLATION	1001				
22.04	23.03	MINING		1.50	3-8,11-24	12500	-
23.03	23.13	RING INSTALLATION	1002				
23.13	23.42	MINING		0.70	3-8,11-24	12500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 14,1984 File Name: DY06-14A
Chainage :Start 1550.05 m
End 1566.85 m Project No: 831-6014
Advance for day 16.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.55	MINING		0.80	5-8,12-24	13000	COMPLETED PUSH
0.55	1.05	RING INSTALLATION	1003				
1.05	2.05	MINING		1.50	3-8,12-24	15000	-
2.05	2.17	RING INSTALLATION	1004				
2.17	3.17	MINING		1.50	3-8,12-24	15000	-
3.17	3.30	RING INSTALLATION	1005				
3.30	4.05	MINING		-	-	-	INCOMPLETE PUSH
4.05	4.35	LUNCH					
4.35	4.55	MINING		1.50	3,4,11-24	15000	COMPLETED PUSH
4.55	5.07	RING INSTALLATION	1006				
5.07	6.05	MINING		1.50	3,4,11-24	15000	-
6.05	6.17	RING INSTALLATION	1007				
6.17	7.17	MINING		1.50	3,4,11-24	15000	-
7.17	7.30	RING INSTALLATION	1008				
7.30	7.45	MINING		0.25	3,4,11-24	15000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGED CUTTERS #8,39,40,42,43. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.08	MAINTENANCE	-	-	-	-	CONTINUE CHANGING CUTTERS
14.08	15.24	MINING		1.25	1,9,10,13,14, 17,18,21,22	15100	COMPLETED PUSH
15.24	15.40	RING INSTALLATION	1009				
15.40	16.13	-- SHIFT CHANGE------					
16.13	16.25	MINING		-	-	-	INCOMPLETE PUSH
16.25	16.30	DELAY					SECONDARY BELT LOCKED OUT
16.30	16.45	MINING		-	-	-	INCOMPLETE PUSH
16.45	16.51	DELAY					INSTALL MESH
16.51	16.55	MINING		-	-	-	INCOMPLETE PUSH
16.55	17.05	DELAY					TROUBLE KEEPING MACHINE RUNNING
17.05	17.10	MINING		-	-	-	INCOMPLETE PUSH, (6 MOTORS USED)
17.10	17.55	DELAY					TROUBLE WITH #3 & 4 MOTORS, HAD TO ISOLATE THE PILOT PRESSURE MANUALLY
17.55	18.24	MINING		1.50	5-8,11-24	12000	COMPLETED PUSH, (6 MOTORS USED)
18.24	18.37	RING INSTALLATION	1010				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUME 14,1984 File Name: DY06-14A
Chainage :Start 1550.05 m
End 1566.85 m Project No: 831-6014
Advance for day 16.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.37	19.14	MINING		-	-	-	INCOMPLETE PUSH
19.14	19.21	DELAY					INSTALL MESH
19.21	20.00	MINING		1.50	3,4,11,13-24	10-11000	COMPLETED PUSH
20.00	20.30	LUNCH					
20.30	20.42	RING INSTALLATION	1011				
20.42	21.36	MINING		1.50	3,4,11,13-24	12500	(8 MOTORS USED)
21.36	21.46	RING INSTALLATION	1012				
21.46	22.40	MINING		1.50	3,4.5,13-24	13000	-
22.40	22.52	RING INSTALLATION	1013				
22.52	23.45	MINING		1.00	3,4,11,13-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY06-15A

Date JUNE 15,1984
Chainage :Start 1566.85 m
End 1584.20 m
Advance for day 17.35 m

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.17	18.27	MINING		-	-	-	INCOMPLETE PUSH
18.27	18.32	RING INSTALLATION	1022				COMPLETE INSTALLATION
18.32	18.43	MINING		-	-	-	INCOMPLETE PUSH
18.43	18.50	DELAY					SECONDARY BELT LOCKED OUT
18.50	19.13	MINING		-	-	-	INCOMPLETE PUSH
19.13	19.18	DELAY					INSTALL MESH
19.18	19.49	MINING		1.50	1-24	13000	COMPLETED PUSH
19.49	20.03	RING INSTALLATION	1023				PARTIAL INSTALLATION
20.03	20.33	LUNCH					
20.33	20.49	RING INSTALLATION	1023				COMPLETE INSTALLATION
20.49	21.36	MINING		1.50	3-8,11-24	13000	-
21.36	22.04	RING INSTALLATION	1024				
22.04	23.03	MINING		1.50	3-8,11-24	13-14000	-
23.03	23.11	RING INSTALLATION	1025				PARTIAL INSTALLATION
23.11	23.26	MINING		-	-	-	
23.26	23.30	RING INSTALLATION	1025				COMPLETE INSTALLATION
23.30	23.42	MINING		0.40	3-8,11-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 15,1984
Chainage :Start 1566.85 m
End 1584.20 m
Advance for day 17.35 m

File Name: DY06-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.35	MINING		0.50	3-8,13-24	15000	COMPLETED PUSH
0.35	0.50	RING INSTALLATION	1014				
0.50	1.45	MINING		1.50	3-8,13-24	15000	-
1.45	1.57	RING INSTALLATION	1015				
1.57	2.20	MINING		-	-	-	INCOMPLETE PUSH
2.20	2.30	DELAY					INSTALL MESH
2.30	3.05	MINING		1.50	3-8,13-24	15000	COMPLETED PUSH
3.05	3.18	RING INSTALLATION	1016				
3.18	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.45	MINING		1.50	3-8,11-24	15000	COMPLETED PUSH
4.45	4.57	RING INSTALLATION	1017				
4.57	5.55	MINING		1.50	3,4,11-24	15000	-
5.55	6.07	RING INSTALLATION	1018				
6.07	7.15	MINING		1.50	3-8,13-24	15000	-
7.15	7.30	RING INSTALLATION	1019				
7.30	7.45	MINING		0.30	3-8,13-24	15000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE	-	-	-	-	CHANGE CUTTERS #1-3,5-7,2-4. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.54	MAINTENANCE	-	-	-	-	REPLACE ROLLERS @ PLOW ON SCNDRY BELT
13.54	14.10	MINING		-	-	-	INCOMPLETE PUSH
14.10	14.24	DELAY					INSTALL MESH
14.24	15.10	MINING		1.20	3-8,13-24	15000	COMPLETED PUSH
15.10	15.25	RING INSTALLATION	1020				
15.25	15.42	MINING		0.45	3-8,13-24	15000	INCOMPLETE PUSH
15.42	16.13	-- SHIFT CHANGE------					
16.13	16.56	MINING		1.05	3,4,5-8.5, 13-24	12000	COMPLETED PUSH
16.56	17.08	RING INSTALLATION	1021				
17.08	17.18	MINING		-	-	-	INCOMPLETE PUSH
17.18	17.20	DELAY					SECONDARY BELT LOCKED OUT
17.20	18.04	MINING		1.45	3,4,9-24	13000	COMPLETED PUSH
18.04	18.17	RING INSTALLATION	1022				PARTIAL INSTALLATION

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 16,1984
Chainage :Start 1584.20 m
End 1589.95 m
Advance for day 5.75 m

File Name: DY06-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.15	MINING		1.10	3-8,11-24	12000	COMPLETED PUSH
1.15	1.30	RING INSTALLATION	1026				
1.30	2.25	MINING		-	-	-	INCOMPLETE PUSH
2.25	2.40	DELAY					INSTALL MESH
2.40	2.48	MINING		1.50	3-16,21-24	12000	COMPLETED PUSH
2.48	3.00	RING INSTALLATION	1027				
3.00	3.55	MINING		1.50	5-24	15000	-
3.55	4.10	RING INSTALLATION	1028				
4.10	4.40	LUNCH					
4.40	5.40	MINING		1.50	3-16,21-24	15000	-
5.40	5.55	RING INSTALLATION	1029				
5.55	6.15	MINING		0.15	3-16,21-24	12000	INCOMPLETE PUSH
6.15	7.45	DELAY & MAINTENANCE					RING #1027 ROTATED
							REMOVE 1 CUTTER IN ORDER TO DRILL A HOLE IN THE FACE.
							DRILL HOLES TO PIN RING #1028
		-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 18,1984
Chainage :Start 1589.71 m
End 1589.71 m
Advance for day 0.00 m

File Name: DY06-1BA

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	10.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43A.
10.00	12.00	DELAY					160 FT. OF DRILLRODS STUCK IN BOREHOLE TRY TO REMOVE. NO SUCCESS
12.00	12.30	LUNCH					ASSORTED MACHINE MAINTENANCE
12.30	15.45	DELAY		-	-	-	TRY TO RETRIEVE DRILLRODS FROM B.H.
15.45	16.15	-- SHIFT CHANGE------					
16.15	23.45	DELAY & MAINTENANCE					TRY TO RETRIEVE DRILLRODS FROM B.H.
							CHANGED 1 SECONDARY BELT SPLICE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 19,1984
Chainage :Start 1589.71 m
End 1589.71 m
Advance for day 0.00 m

File Name: DY06-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	7.45	DELAY & MAINTENANCE		-	-	-	TRY TO RETRIEVE DRILLRODS FROM B.H. (LOGAN DRILLERS)
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	DELAY		-	-	-	TRY TO RETRIEVE DRILLRODS FROM B.H. (LOGAN DRILLERS)
12.00	12.30	LUNCH					
12.30	15.45	DELAY & MAINTENANCE		-	-	-	DRILLRODS RETRIEVED FROM B.H. (LOGAN DRILLERS)
							TRACK CREW INSTALLING LEG SUPPORTS
							T.B.M. SECONDARY BELT SPLICED
15.45	16.15	-- SHIFT CHANGE------					
16.15	20.00	MAINTENANCE & DELAY		-	-	-	REPLACE 1 CUTTER #10 (REMOVED TO FACILITATE DRILLHOLE ACCESS.
							ADJUSTED SECONDARY BELT TENSION
							REMOVED DRILLERS EQUIPMENT FROM SKID
							MADE 2 ATTEMPTS TO MINE WITH T.B.M.,
							EACH TIME RING #1028 STARTED TO ROTATE.
							RESET AND PIN RING #1026 & 1027
20.00	20.30	LUNCH					
20.30	23.45	MAINTENANCE					
							END RESET AND PIN OF RING #1026 & 1027
							REMOVE SPECIAL SHORT THRUST BEAMS
							JOINING RING #1028 & 1029 AND INSTALLED
							REGULAR LENGTH BEAMS.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 20,1984
Chainage :Start 1589.71 m
End 1596.89 m
Advance for day 7.18 m

File Name: DY06-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	7.45	MAINTENANCE		-	-	-	MADE 2 ATTEMPTS TO MINE WITH T.B.M., BUT RING #1028 WAS BUCKLING . PINNED RING #1028
7.45	8.15	-- SHIFT CHANGE------					
8.15	11.05	MAINTENANCE		-	-	-	INSTALLED ~14 ROCKBOLTS (RING #1028)
11.05	11.10	MAINTENANCE					CLEANUP OF EQUIPMENT
11.10	12.00	MINING		-	-	-	INCOMPLETE PUSH (T.B.M. SLOW PROGRESS)
12.00	12.30	LUNCH					
12.30	13.05	MINING		0.20	-	-	INCOMPLETE PUSH (T.B.M. SLOW PROGRESS)
13.05	13.22	MINING		0.29	3-12,17-24	16000	INCOMPLETE PUSH (T.B.M. APPEARS TO BE MOVING MORE FREELY)
13.22	14.25	DELAY					EXPAND RING #1027 & 1028, INSTALLED LAGGING AND REINSTALLED WEDGES.
14.25	14.42	MINING		-	1,5,9,16,17, 18,22.	14000	INCOMPLETE PUSH
14.42	14.52	DELAY					T.B.M. BELT STOPPED
14.52	15.28	MINING		0.75	1,5,9,16,17, 18,22.	14000	COMPLETED PUSH
15.28	15.45	RING INSTALLATION	1030				PARTIAL INSTALLATION
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.45	RING INSTALLATION	1030				COMPLETE INSTALLATION
16.45	17.25	MAINTENANCE		-	-	-	REMOVE 2 BROKEN ROLLERS FROM SCORY BELT
17.25	17.55	MINING		-	-	-	INCOMPLETE PUSH
17.55	18.10	DELAY					EXPAND RING #1029 AND INSTALL MESH
18.10	18.47	MINING		1.45	3-12,17-24	10000	COMPLETED PUSH
18.47	19.00	RING INSTALLATION	1031				
19.00	19.30	MINING		-	-	-	INCOMPLETE PUSH
19.30	19.45	DELAY					EXPAND RING #1030 AND INSTALL MESH
19.45	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.50	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
20.50	21.00	RING INSTALLATION	1032				
21.00	22.00	MINING		1.50	3,4,9-24	13000	-
22.00	22.15	RING INSTALLATION	1033				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 20,1984
Chainage :Start 1589.71 m
End 1596.89 m
Advance for day 7.18 m

File Name: DY06-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.15	22.30	DELAY		-	-	-	ADJUSTED ROLLERS TO ALIGN NO.2 CONVEYOR BELT
22.30	23.30	MINING		1.50	3,4,13-24	13000	-
23.30	23.45	RING INSTALLATION -- SHIFT CHANGE	1034				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel B 2)

Date JUNE 21,1984
Chainage :Start 1596.89 m
End 1611.89 m
Advance for day 15.00 m

File Name: BY06-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.00	DELAY					FII SEVERED WATERHOSE (CAUGHT IN SKID)
1.00	2.10	MINING		1.50	3,4,13-24	11000	-
2.10	2.25	RING INSTALLATION	1035				
2.25	3.24	MINING		1.50	3-8,13-24	12000	-
3.24	3.40	RING INSTALLATION	1036				
3.40	4.05	LUNCH					
4.05	5.04	MINING		1.50	3-8,14,16, 17-24	14000	-
5.04	5.24	RING INSTALLATION	1037				
5.24	6.18	MINING		1.50	3-8,14,16, 17-24	14000	-
6.18	6.38	RING INSTALLATION	1038				
6.38	7.40	MINING		1.50	3-8,17-24	14000	-
7.40	8.15	-- SHIFT CHANGE------					
8.15	11.52	MAINTENANCE					CHANGED CUTTERS 037,41,43. ASSORTED MACHINE MAINTENANCE
11.52	12.05	RING INSTALLATION	1039				
12.05	12.35	LUNCH					
12.35	12.51	MINING		0.43	1,2,5,6,17,20, 21,24	12500	INCOMPLETE PUSH
12.51	12.58	DELAY					NO.2 BELT STOPPED
12.58	13.40	MINING		1.07	5,6,10,17,18, 21,22	13500	COMPLETED PUSH
13.40	13.55	RING INSTALLATION	1040				
13.55	14.20	MINING		0.50	1,2,5,6,10,18, 21,22	14000	INCOMPLETE PUSH
14.20	14.29	DELAY					INSTALL MESH
14.29	15.07	MINING		1.00	2,5,6,10,13,14 21,22	13500	COMPLETED PUSH
15.07	15.18	RING INSTALLATION	1041				
15.18	15.45	MINING		0.70	1,2,5,6,10,13, 14,21,22	15000	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.50	MINING		0.80	3-8,10-24	12000	COMPLETED PUSH
16.50	17.05	RING INSTALLATION	1042				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date JUNE 21,1984
Chainage :Start 1596.89 m
End 1611.89 m
Advance for day 15.00 m

File Name: DY06-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.05	17.20	DELAY					CHECK LOCATION OF B.H. IN FACE
17.20	18.18	MINING		1.50	3-8,10-24	13000	-
18.18	18.30	RING INSTALLATION	1043				
18.30	19.30	MINING		1.50	3-8,13-24	15000	-
19.30	19.45	RING INSTALLATION	1044				
19.45	20.15	LUNCH					
20.15	23.45	DELAY		-	-	-	NO.2 MAIN CONVEYOR BELT BROKEN AT 19.45 COMMENCE REPAIR WORK
		-- SHIFT CHANGE					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 22,1984 File Name: DY06-22A
Chainage :Start 1611.89 m
End 1625.25 m Project No: 831-6014
Advance for day 13.36 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	— SHIFT CHANGE------					
0.15	4.00	DELAY		-	-	-	REPAIR NO.2 MAIN CONVEYOR BELT
4.00	4.30	LUNCH					
4.30	5.35	DELAY		-	-	-	FINISH NO.2 MAIN CONVEYOR BELT REPAIR
5.35	6.33	MINING		1.50	3-8,13-24	13500	-
6.33	6.48	RING INSTALLATION	1045				
6.48	7.44	MINING		1.50	3,4,13-24	15000	-
7.44	8.15	-- SHIFT CHANGE------					
8.15	8.27	RING INSTALLATION	1046				
8.27	9.50	MINING		1.50	3,4,13,14,17, 18,21,22	13000	-
9.50	9.57	RING INSTALLATION	1047				
9.57	10.43	MINING		-	-	-	INCOMPLETE PUSH
10.43	10.46	DELAY					INSTALL MESH
10.46	10.55	MINING		-	-	-	INCOMPLETE PUSH
10.55	10.57	DELAY					SECONDARY BELT STOPPED
10.57	11.11	MINING		1.50	1,2,4,9,13,17, 18,21,22	14000	COMPLETED PUSH
11.11	11.22	RING INSTALLATION	1048				
11.22	11.49	MINING		0.47	1,3,6,17-19, 21,22	13000	INCOMPLETE PUSH
11.49	12.30	LUNCH					
12.30	15.45	MAINTENANCE					CHANGED CUTTERS 8,20,24,36,37.
							EXTEND CONVEYOR BELT
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.25	DELAY		-	-	-	CHECK ALIGNMENT ON NO.2 MAIN CONVEYOR
16.25	17.10	MINING		1.03	3,4,13-24	15000	COMPLETED PUSH
17.10	17.25	RING INSTALLATION	1049				
17.25	18.25	MINING		1.50	3,4,10-24	15000	-
18.25	18.40	RING INSTALLATION	1050				
18.40	19.45	MINING		1.50	3-8,11-24	15000	-
19.45	20.00	RING INSTALLATION	1051				
20.00	20.30	LUNCH					
20.30	21.00	MINING		-	-	-	INCOMPLETE PUSH
21.00	21.15	DELAY					INSTALL MESH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 22,1984
Chainage :Start 1611.89 m
End 1625.25 m
Advance for day 13.36 m

File Name: DY06-22A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.15	21.35	MINING		1.40	3,4,10-24	15000	COMPLETED PUSH
21.35	21.50	RING INSTALLATION	1052				
21.50	22.25	MINING		-	-	-	INCOMPLETE PUSH
22.25	22.40	DELAY					INSTALL LAGGING
22.40	22.55	MINING		1.50	3-8,10-24	15000	COMPLETED PUSH
22.55	23.07	RING INSTALLATION	1053				
23.07	23.45	MINING		0.75	3-8,10-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 23,1984 File Name: DY06-23A
Chainage :Start 1625.25 m
End 1627.78 m Project No: 831-6014
Advance for day 2.53 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.52	MINING		0.75	3-8,13-24	15000	COMPLETED PUSH
0.52	1.06	RING INSTALLATION	1054				
1.06	3.00	MINING		-	-	-	INCOMPLETE PUSH
3.00	4.00	MAINTENANCE					CHANGED CUTTERS #10,32,33,34.
4.00	4.30	LUNCH					
4.30	5.28	MAINTENANCE					CONTINUE CHANGING CUTTERS
5.28	5.50	MINING		1.50	1-24	15000	COMPLETED PUSH
5.50	6.13	RING INSTALLATION	1055				PRIMED PUMP
6.13	7.43	MINING		0.28	1-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUME 25,1984
Chainage :Start 1627.78 m
End 1627.78 m
Advance for day 0.00 m

File Name: DY06-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE		-	-	-	PINNED RING #1054 WITH 14 SETS OF PINS ASSORTED MACHINE MAINTENANCE REPLACED SPLICE ON PRIMARY CONVEYOR CHANGED CUTTERS #43A,42B.
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.45	MAINTENANCE		-	-	-	FINISH RE-SPLICING PRIMARY CONVEYOR
17.45	18.15	DELAY					T.B.M. STUCK (NO ADVANCE)
18.15	20.00	MAINTENANCE		-	-	-	PINNED RING #1053 WITH 9 SETS OF PINS RE-BOLT RING #1054
20.00	20.30	LUNCH					
20.30	23.45	MAINTENANCE		-	-	-	PINNED RING #1051 WITH 2 SETS OF PINS PINNED RING #1052 WITH 10 SETS OF PINS CONTINUE PINNING RINGS #1053 & 1054
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 26,1984
Chainage :Start 1627.78 m
End 1627.78 m
Advance for day 0.00 m

File Name: DY06-26A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	SHIFT CANCELLED					T.B.M. STUCK
8.00	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE & DELAY		-	-	-	COMPLETED PINNING RINGS #1053 & 1054 ASSORTED MACHINE MAINTENANCE TRY TO MOVE T.B.M., NO SUCCESS
15.45	16.15	-- SHIFT CHANGE------					
16.15	18.00	MAINTENANCE & DELAY		-	-	-	SET UP FOR BURNING 2.25 INCH HOLES AND DRILLING THROUGH TAILSKIN
18.00	20.00	DELAY					BURN & DRILL HOLES FOR 2 INCH DIA.PINS
20.00	20.30	LUNCH					
20.30	23.45	DELAY		-	-	-	CONTINUE BURNING & DRILLING HOLES
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 27,1984
Chainage :Start 1627.78 m
End 1627.78 m
Advance for day 0.00 m

File Name: DY06-274

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	SHIFT CANCELLED					T.B.M. STUCK
8.00	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE & DELAY		-	-	-	CHANGED CUTTERS #16,38. ASSORTED MACHINE MAINTENANCE ATTEMPTED TO MOVE T.B.M. HEAD BACK BUT HAD NO SUCCESS AS THE 2 INCH PINS WERE BENDING. REPLACED NINE 2 INCH PINS, WITHDREW AND TURNED AROUND THE REMAINDER. BURN & DRILL 3 INCH HOLES THROUGH TAILSKIN FOR 2.75 INCH DIA. PINS. DRILLED OFF & INSTALLED SIX 2.75 INCH DIA. PINS.
15.45	16.15	-- SHIFT CHANGE------					
16.15	20.00	DELAY		-	-	-	CUT HOLES THROUGH TAILSKIN, DRILL & INSTALL 2.75 IN. DIA. & 36 IN. PINS.
20.00	20.30	LUNCH					
20.30	21.30	DELAY		-	-	-	ATTEMPT TO PULL T.B.M. BACK USING THE 16 STEERING CYLINDERS (NO MOVEMENT)
21.30	22.00	DELAY		-	-	-	SET UP TO DRILL & INSTALL METAL WEDGES
22.00	23.45	DELAY		-	-	-	INSTALL 3 WEDGES BETWEEN CUTTERS & ROCK FACE.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 28,1984 File Name: DY06-28A
Chainage :Start 1627.78 m
End 1627.78 m Project No: 831-6014
Advance for day 0.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	4.30	DELAY		-	-	-	REMOVED 1 CUTTER, BEGIN INSTALLING 2 STEEL WEDGES BETWEEN THE CUTTERS & FACE
4.30	5.00	LUNCH					
5.00	6.50	DELAY		-	-	-	END WEDGE INSTALLATION & REPLACE CUTTER
6.50	7.45	DELAY		-	-	-	TRYED TO CLEAR T.B.M.(UNSUCESSFUL)
7.45	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE & DELAY		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED 3 CUTTERS RE-SPLICED SECONDARY CONVEYOR 16 HOLES WERE DRILLED OFF IN THE UPPER WEST HAUNCH OF T.B.M. FACE AREA. 13 HOLES WERE LOADED AND BLASTED.
15.45	16.15	-- SHIFT CHANGE------					
16.15	20.00	DELAY		-	-	-	DRILL OFF & BLAST CHAMBER IN FRONT OF T.B.M. HEAD.
20.00	20.30	LUNCH					
20.30	23.45	DELAY		-	-	-	CONTINUE DRILLING & BLASTING CHAMBER
		-- SHIFT CHANGE------					

Notes:

Dontin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 29,1984 File Name: DY06-29A
Chainage :Start 1627.78 m
End 1627.78 m Project No: 831-6014
Advance for day 0.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	4.20	DELAY		-	-	-	DRILLED 40-3.5 FT. HOLES, CHARGED & BLASTED 20 HOLES (1 ROUND)
4.20	4.50	LUNCH					
4.50	6.00	DELAY		-	-	-	CHARGED & BLASTED 20 HOLES (1 ROUND)
6.00	7.00	DELAY		-	-	-	RECHARGED & BLASTED 4 HOLES (2 ROUNDS)
7.00	7.45	DELAY		-	-	-	CLEANED LOOSE STONE AT CUTTING HEAD
7.45	8.15	-- SHIFT CHANGE------					
8.15	15.45	DELAY		-	-	-	DRILLED & BLASTED OVER T.B.M. BLAST MUCKED OUT, TRY TO PULL BACK T.B.M. HEAD (UNSUCESSFUL)
15.45	16.15	-- SHIFT CHANGE------					
16.15	20.00	DELAY		-	-	-	DRILLED OFF ROUND ABOVE CUTTERHEAD
20.00	20.20	DELAY		-	-	-	LOAD & BLAST HOLES
20.20	21.05	MAINTENANCE					START TO CHANGE GAUGE CUTTERS
21.05	23.45	DELAY		-	-	-	DRILLED OFF ANOTHER ROUND ABOVE & DOWN THE SIDES OF THE CUTTERHEAD.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JUNE 30,1984
Chainage :Start 1627.78 m
End 1627.78 m
Advance for day 0.00 m

File Name: DY06-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.20	DELAY		-	-	-	POWER TROUBLE
1.20	2.05	DELAY		-	-	-	TRYED TO CLEAR T.B.M. USING STEERING CYLINDERS & ROTATING CUTTING HEAD
2.05	2.45	MAINTENANCE		-	-	-	CHANGED CUTTERS #42,43.
2.45	3.35	DELAY					TRY TO CLEAR T.B.M. AGAIN.
3.35	4.00	DELAY		-	-	-	SET UP DRILL AT FACE
4.00	4.30	LUNCH					
4.30	5.30	DELAY		-	-	-	DRILLED & BLASTED 8 HOLES
5.30	7.10	DELAY					DRILLED & BLASTED 6 HOLES
7.10	7.45	DELAY		-	-	-	CLEANED STONES FROM CUTTINGHEAD & TAIL ROLLER-PRIMARY BELT
7.45	8.10	-- SHIFT CHANGE------					
8.10	8.30	DELAY		-	-	-	TRYED TO PULL T.B.M. BACK (NO SUCCESS)
8.30	11.35	DELAY		-	-	-	REMOVE PINS FROM TAILSKIN WHICH WERE INSTALLED INTO ROCK. APPROX. 30 PINS HAD TO BE BURNED OUT.
11.35	11.45	DELAY		-	-	-	TRYED TO ADVANCE T.B.M. BUT BOLTS ON RING #1054 WEST SIDE BROKE & RING ROTATED, BREAKING 7 SETS OF PINS WHICH WERE INSTALLED TO PREVENT ROTATION.
11.45	12.00	DELAY		-	-	-	REPLACED BROKEN RING BOLTS
12.00	12.30	LUNCH					
12.30	13.37	DELAY		-	-	-	ROTATED RING #1054 TO ORIGINAL POSITION
13.37	15.20	DELAY					INSTALLED 13-3.5 FT. ROCKBOLTS TO REPLACE ONES BROKEN TO PREVENT ROTATION
15.20	15.27	DELAY		-	-	-	PLACED EXPANSION RING AGAINST RING#1054
15.27	15.43	DELAY		-	-	-	TRYED TO ADVANCE T.B.M. (NO SUCCESS)
15.43	16.15	-- SHIFT CHANGE------					
16.15	17.50	DELAY		-	-	-	DRILL & BLAST WEST SIDE OF TIGHT AREA
17.50	19.15	DELAY					DRILL & BLAST EAST SIDE OF TIGHT AREA
19.15	20.00	DELAY		-	-	-	CLEAN MUCK FROM CUTTERHEAD & TRY TO ADVANCE T.B.M. (NO SUCCESS)
20.00	20.30	LUNCH					
20.30	23.45	DELAY		-	-	-	HAND MUCK SIDES OF CUTTERHEAD
		-- SHIFT CHANGE------					DRILL & BLAST EAST SIDE OF TIGHT AREA

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 1,1984
Chainage :Start 1628.94 m
End 1630.65 m
Advance for day 1.71 m

File Name: DY07-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.30	DELAY		-	-	-	BREAKING LARGE STONES ON PRIMARY BELT
0.30	1.50	DELAY					ATTEMPTING TO CLEAR T.B.M. NO MOVEMENT
1.50	3.10	DELAY		-	-	-	DRILLED AND BLASTED SIX HOLES-EAST SIDE
3.10	4.00	DELAY					ATTEMPTED TO CLEAR T.B.M. NO MOVEMENT
4.00	4.30	LUNCH					
4.30	6.15	DELAY		-	-	-	DRILLED AND BLASTED 4 HOLES-EAST SIDE
6.15	6.35	DELAY					ATTEMPTED TO CLEAR T.B.M. NO MOVEMENT
6.35	7.45	DELAY		-	-	-	DRILLED AND BLASTED 2 HOLES-EAST SIDE
7.45	8.15	-- SHIFT CHANGE------					
8.15	8.30	DELAY		-	-	-	CHECKED LAST BLAST
8.30	8.39	MINING		-	-	-	T.B.M. MOVING BUT RING #1054 BOLTS ON WEST SPRING LINE BROKE.INCOMPLETE PUSH
8.39	10.30	DELAY		-	-	-	STRAIGHTEN RING #1053&1054
10.30	12.00	MAINTENANCE					ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.14	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
15.14	15.42	MINING		0.41	1-24	13-14000	INCOMPLETE PUSH
15.42	16.15	-- SHIFT CHANGE------					
16.15	16.20	DELAY					INSPECT RINGS PRIOR TO MINING
16.20	17.25	MINING		0.60	1-4,9-24	15000	COMPLETED PUSH
17.25	17.45	DELAY					BROKEN HYD.LINE ON PUSH RING RETURN CYL
17.45	18.20	RING INSTALLATION	1056				THRUST BEAMS WERE TIGHT HARD TO INSTALL
18.20	18.25	MINING		-	-	-	INCOMPLETE PUSH
18.25	20.00	DELAY		-	-	-	PINNED RING #1055 WITH 4 SETS OF PINS AND 3-2 3/4" X 24" BARS
20.00	20.20	DELAY		-	-	-	PULLED BACK EXPANSION RING BY HAND TO SUPPORT RING #1055
20.20	20.30	MINING		-	-	-	INCOMPLETE PUSH
20.30	20.45	DELAY					POWER ON T.B.M. TRIPPED OUT
20.45	21.15	LUNCH					
21.15	21.30	MINING		-	-	-	INCOMPLETE PUSH
21.30	22.00	DELAY					INSTALL MESH AND EXPAND RING #1055
22.00	22.10	MINING		-	-	-	INCOMPLETE PUSH
22.10	22.50	DELAY					EAST SPRINGLINE RING JOINT SEPARATED
22.50	23.45	MINING		0.70	1-4,9-24	15000	RE-BOLTED & INST'D 2-1 3/4"X24"BARS

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 3, 1984 — File Name: DY07-03A
Chainage :Start 1630.65 m
End 1632.50 m — Project No: 831-6014
Advance for day 1.85 m

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
8.00	8.15	-- SHIFT CHANGE------					
8.15	11.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE INSTALLED ROCKBOLTS (RING #1055-1056)
11.00	11.10	MINING		-	-	-	
11.10	11.30	DELAY		-	-	-	INSTALLED ONE SPECIAL WEDGE(RING #1055)
11.30	12.15	MINING		0.80	1-4,9-24	15000	COMPLETED PUSH
12.15	12.45	LUNCH					
12.45	15.45	RING INSTALLATION &DELAY	1057	-	-	-	PINNED RING #1056 WITH 8 SETS OF 3' ROCK BOLTS
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.56	MINING		-	-	-	INCOMPLETE PUSH
16.56	17.23	DELAY		-	-	-	PIN SHEARED OFF (LOWER WEST SIDE OF RING #1056)
17.23	17.38	MINING		-	-	-	INCOMPLETE PUSH
17.38	17.49	DELAY		-	-	-	POWER TRIPPED OFF BOOST AND PUSH PUMPS
17.49	18.28	MINING		-	-	-	INCOMPLETE PUSH
18.28	22.30	DELAY		-	-	-	RING #1056 ROTATED DURING EXPANSION
22.30	22.50	DELAY		-	-	-	MAIN BELT LOCKED OUT
22.50	23.15	MINING		1.00	3,4,9-24	10000	COMPLETED PUSH
23.15	23.31	RING INSTALLATION	1058				
23.31	23.42	MINING		0.05	3,4,9-24	9500	INCOMPLETE PUSH
23.42	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel A 2)

File Name: DY07-04A

Date JULY 4,1984
Chainage :Start 1632.46 m
End 1634.36 m
Advance for day 1.90 m

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.45	DELAY		-	-	-	INSTALL MESH
0.45	1.02	MINING		0.25	9-24	10000	INCOMPLETE PUSH
1.02	1.22	DELAY		-	-	-	INSTALL MESH AND LAGGING
1.22	1.42	MINING		0.30	9-24	10000	INCOMPLETE PUSH
1.42	2.15	DELAY		-	-	-	INSTALL MESH AND EXPAND RING #1057
2.15	3.45	DELAY		-	-	-	PINNED RING #1057 WITH 6 SETS OF 3'PINS & 2-1 3/4" BARS INST'D 7-4' ROCK BOLTS IN BACK
3.45	4.00	MINING		0.15	9-24	10000	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.55	MINING		0.20	9-24	10000	COMPLETED PUSH
4.55	5.18	RING INSTALLATION	1059				
5.18	5.48	MINING		0.20	9-24	12000	INCOMPLETE PUSH
5.48	6.30	DELAY		-	-	-	PINNED RING #1058 WITH 6 SETS OF PINS
6.30	7.45	DELAY		-	-	-	SCALING LOOSE FROM BACK SLOW MINING PROGRESS DUE TO LOOSE CAUSED BY BLASTING AROUND THE T.B.M.
7.45	8.00	-- SHIFT CHANGE------					
8.00	15.00	MAINTENANCE		-	-	-	CHANGED CUTTER #43 ASSORTED MACHINE MAINTENANCE SCALED LOOSE FROM BACK BEHIND T.B.M. AND INST'D ROCK BOLTS
12.00	12.30	LUNCH					
15.00	15.30	-- SHIFT CHANGE------		-	-	-	
15.30	16.00	SAFTEY MEETING					
16.00	16.20	-- SHIFT CHANGE------					
16.20	20.00	DELAY		-	-	-	ROCK BOLTING AND SCREENING AND SCALING
20.00	20.30	LUNCH					
20.30	22.00	DELAY		-	-	-	INST'D WOOD LAGGING
22.00	22.54	MINING		0.80	3,4,13-24	12000	COMPLETED PUSH
22.54	23.45	DELAY		-	-	-	PULLED RING #1060 AHEAD BUT NOT BUILT SCALED EAST UPPER WALL & HAUNCH. INST'D 3 ROCK BOLTS IN WEST UPPER HAUNCH
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: JULY 5,1984
Chainage: Start 1634.36 m
End 1637.36 m
Advance for day 3.00 m

File Name: DY07-05A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.40	DELAY		-	-	-	HAND MUCKING AROUND T.B.M. INVERT
1.40	1.50	RING INSTALLATION	1059				
1.50	2.10	RING INSTALLATION	1060				
2.10	3.05	MINING		0.40	13-24	15000	PINNED RING #1059
3.05	3.50	DELAY		-	-	-	INSTALL MESH AND LAGGING
3.50	4.05	MINING		0.10	13-24	15000	INCOMPLETE PUSH
4.05	4.35	LUNCH					
4.35	7.00	MAINTENANCE & DELAY		-	-	-	INSPECT CUTTERS, PACK VOID IN CROWN WITH LAGGING, CHANGE GAUGE OF CUTTERS
7.00	7.15	-- SHIFT CHANGE------					CHANGED CUTTER #43A
7.15	8.00	SAFTEY FILM					
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE & DELAY		-	-	-	ASSORTED MACHINE MAINTENANCE
							SECURING ROOF OVER INST'D RING RAILS
12.00	12.30	LUNCH					CHANGED CUTTERS #42B,42B.
12.30	13.05	MAINTENANCE					
13.05	13.35	MINING		0.40	3,4,13-24	15000	COMPLETED PUSH
13.35	13.55	RING INSTALLATION	1061				
13.55	14.30	DELAY		-	-	-	SCALING LOOSE STONES
14.30	14.45	MINING		0.10	3,4,13-24	13500	INCOMPLETE PUSH
14.45	15.45	DELAY		-	-	-	ASSORTED MACHINE MAINTENANCE
							PINNED RING #1060
15.45	16.00	-- SHIFT CHANGE------					
16.00	16.35	SAFTEY FILM					
16.35	16.50	-- SHIFT CHANGE------					
16.50	17.23	DELAY		-	-	-	ROCK BOLTING,PINNING OF RING #1060
17.23	18.07	MINING		-	-	-	INCOMPLETE PUSH
18.07	20.00	DELAY		-	-	-	INST'D LAGGING AND 5 ROCK BOLTS.
20.00	20.30	LUNCH					
20.30	20.56	MINING		1.00	3,4,13-24	15000	COMPLETED PUSH
20.56	22.01	RING INSTALLATION &	1062				
		DELAY		-	-	-	PINNED RING #1061 WITH 4 SETS OF PINS
22.01	23.03	MINING		1.00	3,4,13-24	15000	COMPLETE PUSH/ LOST 10 MIN.ON SCREENING
23.03	23.24	RING INSTALLATION	1063				
23.24	23.45	DELAY		-	-	-	BELTS LOCKED OUT/-SHIFT CHANGE-1024.00

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 6,1984
Chainage :Start 1637.36 m
End 1644.61 m
Advance for day 7.25 m

File Name: DY07-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.35	DELAY		-	-	-	INSTALL MESH
0.35	1.25	MINING		1.00	3,4,12-24	15000	COMPLETE PUSH
1.25	1.40	DELAY		-	-	-	CLEAN OUT BEHIND PUSH RING
1.40	2.00	RING INSTALLATION	1064				
2.00	2.20	MINING		-	-	-	INCOMPLETE PUSH
2.20	2.30	DELAY		-	-	-	BELT TRIPPED OFF
2.30	3.25	MINING		1.50	3,4,13-24	14000	COMPLETED PUSH
3.25	3.45	RING INSTALLATION	1065				
3.45	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.40	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
5.40	6.00	RING INSTALLATION	1066				
6.00	7.20	MINING		1.50	3,4,13-24	15000	-
7.20	7.45	RING INSTALLATION	1067				
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS #43A,26,42B,40. PINNED RING #1066 WITH 4 SETS OF PINS
12.00	12.30	LUNCH					
12.30	14.30	MAINTENANCE		-	-	-	CONTINUED ASSORTED MACHINE MAINTENANCE
14.30	15.45	DELAY		-	-	-	SECONDARY BELT KICKED OFF
15.45	16.18	-- SHIFT CHANGE------					
16.18	17.28	MINING		1.50	3,4,13-24	15000	-
17.28	17.40	RING INSTALLATION	1068				
17.40	17.56	MINING		0.25	3,4,13-24	14500	INCOMPLETE PUSH
17.56	20.00	MAINTENANCE & DELAY		-	-	-	WASHING T.B.M. FOR NECESSARY WELDING
20.00	20.30	LUNCH					
20.30	23.45	MAINTENANCE & DELAY		-	-	-	WELDING IS TO TAKE PLACE ASSORTED MACHINE MAINTENANCE
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 7,1984
Chainage :Start 1644.65 m
End 1644.65 m
Advance for day 0.00 m

File Name: DY07-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	4.00	MAINTENANCE & DELAY		-	-	-	CLEAN AND WASH T.B.M. FOR WELDING ASSORTED MACHINE MAINTENANCE BLAST #14 MANWAY
4.00	4.30	LUNCH					
4.30	7.45	MAINTENANCE & DELAY		-	-	-	RESUME PREVIOUS ACTIVITY
7.45	8.00	-- SHIFT CHANGE------					END OF WORK FOR DAY -WEEKEND-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 9,1984 File Name: DY07-09A
Chainage :Start 1644.65 m
End 1647.22 m Project No: 831-6014
Advance for day 2.57 m

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
0.00	8.00	NO WORK CARRIED OUT		-	-	-	WEEKEND
8.00	16.00	MAINTENANCE & DELAY		-	-	-	ASSORTED MACHINE MAINTENANCE WELDING CRACKS ON T.B.M.
16.00	16.15	-- SHIFT CHANGE------					
16.15	20.00	DELAY		-	-	-	WELDING REPAIRS ON T.B.M.
20.00	20.30	LUNCH					
20.30	21.40	DELAY		-	-	-	T.B.M. CUTTING OUT-WATER IN WEST LOCKOUT SWITCH.
21.40	22.20	MINING		1.25	5-8,13-24	14000	COMPLETED PUSH
22.20	22.30	RING INSTALLATION	1069				
22.30	22.40	DELAY		-	-	-	CONTINUED PROBLEMS WITH WEST LOCKOUT SWITCH.
22.40	23.45	MINING		1.40	5-8,13-24	14000	INCOMPLETE PUSH
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: JULY 10,1984
Chainage: Start 1647.22 m
End 1659.32 m
Advance for day 12.10 m

File Name: DY07-10A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.35	MINING		0.10	3,4,13-24	15000	COMPLETED PUSH
0.35	0.55	RING INSTALLATION	1070				
0.55	1.15	MINING		-	-	-	INCOMPLETE PUSH
1.15	1.30	DELAY		-	-	-	INSTALL MESH AND LAGGING
1.30	2.30	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
2.30	2.48	RING INSTALLATION	1071				
2.48	3.15	MINING		-	-	-	INCOMPLETE PUSH
3.15	3.30	DELAY		-	-	-	INSTALL MESH AND LAGGING
3.30	4.15	MINING		1.50	3,4,11-24	15000	COMPLETED PUSH
4.15	4.30	RING INSTALLATION	1072				
4.30	5.00	LUNCH					
5.00	5.30	MINING		-	-	-	INCOMPLETE PUSH
5.30	5.45	DELAY		-	-	-	INSTALL MESH AND LAGGING
5.45	6.25	MINING		1.50	3,4,11-24	15000	COMPLETED PUSH
6.25	6.40	RING INSTALLATION	1073				
6.40	7.05	MINING		-	-	-	INCOMPLETE PUSH
7.05	7.15	DELAY		-	-	-	INSTALL MESH AND LAGGING
7.15	7.45	MINING		1.00	3,4,11-24	,15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE PINNED RING #1072. WELDING ON T.B.M. CHANGED CUTTERS #43A,42B,30,34.
16.00	16.15	-- SHIFT CHANGE------					
16.15	16.50	MINING		0.50	3,4,9-24	14000	COMPLETED PUSH
16.50	17.10	RING INSTALLATION	1074				
17.10	18.25	MINING		1.50	3,4,9-24	14000	-
18.25	18.40	RING INSTALLATION	1075				
18.40	19.55	MINING		1.50	3,4,9-24	14000	-
19.55	20.15	RING INSTALLATION	1076				
20.15	20.45	LUNCH					
20.45	22.10	MINING		1.50	3,4,9-24	15000	#748 MAIN DRIVE MOTORS DOWN.
22.10	22.30	RING INSTALLATION	1077				
22.30	23.45	MINING		1.50	3,4,9-24	14000	-
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 11,1984
Chainage :Start 1659.32 m
End 1672.93 m
Advance for day 13.61 m

File Name: DY07-11A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.30	RING INSTALLATION	1078				
0.30	0.35	MINING		-	-	-	INCOMPLETE PUSH
0.35	0.50	DELAY		-	-	-	MOVING SECONDARY BELT
0.50	1.55	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
1.55	2.10	RING INSTALLATION	1079				
2.10	2.35	MINING		-	-	-	INCOMPLETE PUSH
2.35	2.45	DELAY		-	-	-	INSTALL MESH AND LAGGING
2.45	3.25	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
3.25	3.40	RING INSTALLATION	1080				
3.40	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	4.50	MINING		-	-	-	INCOMPLETE PUSH
4.50	5.05	DELAY		-	-	-	INSTALL MESH AND LAGGING
5.05	5.40	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
5.40	5.55	RING INSTALLATION	1081				
5.55	6.25	MINING		-	-	-	INCOMPLETE PUSH
6.25	6.40	DELAY		-	-	-	INSTALL MESH AND LAGGING
6.40	7.20	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
7.20	7.35	RING INSTALLATION	1082				
7.35	7.45	MINING		0.10	3,4,13-24	15000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE & MINING		0.21	3,4,13-24	- 14000	WELDING ON T.B.M. ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS #43B,29,42A,35,31.
16.00	16.15	-- SHIFT CHANGE------					
16.15	16.30	DELAY		-	-	-	INSTALL MESH AND LAGGING.
16.30	16.35	MINING		-	-	-	INCOMPLETE PUSH
16.35	16.45	DELAY		-	-	-	NO WATER
16.45	17.30	MINING		1.30	3,4,13-24	14000	COMPLETED PUSH
17.30	17.50	RING INSTALLATION	1083				
17.50	18.05	MINING		-	-	-	INCOMPLETE PUSH
18.05	18.10	DELAY		-	-	-	INSTALL MESH
18.10	18.50	MINING		1.50	3,4,13-24	14000	COMPLETED PUSH
18.50	19.00	RING INSTALLATION	1084				
19.00	20.00	MINING		1.50	13-24	14000	-

Notes: "INSTALL MESH AND LAGGING" CONSIDERED AS A DELAY BECAUSE THEY ARE NORMALLY INSTALLED WHILE THE T.B.M. IS IN MOTION.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 11,1984
Chainage :Start 1659.32 m
End 1672.93 m
Advance for day 13.61 m

File Name: DY07-11A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.00	20.30	LUNCH					
20.30	20.45	RING INSTALLATION	1085				
20.45	21.55	MINING		1.50	13-24	14000	-
21.55	22.05	RING INSTALLATION	1086				
22.05	23.05	MINING		1.50	13-24	14000	-
23.05	23.15	RING INSTALLATION	1087				
23.15	23.45	DELAY		-	-	-	BEARINGS ON SCRUBBER FAN BURNED OUT
23.45	24.00	-- SHIFT CHANGE----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 12,1984
Chainage :Start 1672.93 m
End 1672.93 m
Advance for day 0.00 m

File Name: DY07-12A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.14	4.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE AND REPAIR
4.00	4.30	LUNCH					
4.30	7.45	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE LOADED FAN MOTOR & SENT TO SURFACE.
7.45	8.00	-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	PINNED RING @1085 CHANGED CUTTERS @43A,16,14,17,25,27.
16.00	24.00	MAINTENANCE		-	-	-	RE-INSTALL FAN MOTOR. MAKE FORM WORK AROUND VOID WHERE T.B.M IS STUCK INST'D NEW MUCK CURTAIN ON T.B.M. -- SHIFT CHANGE------

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 13,1984
Chainage :Start 1672.93 m
End 1687.33 m
Advance for day 14.40 m

File Name: DY07-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.15	MINING		1.20	3,4,10,12-24	14000	COMPLETED PUSH
1.15	1.30	RING INSTALLATION	1088				
1.30	2.00	MINING		-	-	-	INCOMPLETE PUSH
2.00	2.10	DELAY		-		-	INSTALL MESH AND LAGGING
2.10	2.20	MINING		1.00	3,4,10,12-24	14000	COMPLETED PUSH
2.20	2.35	RING INSTALLATION	1089				
2.35	3.10	MINING		-	-	-	INCOMPLETE PUSH
3.10	3.20	DELAY		-	-	-	INSTALL MESH AND LAGGING.
3.20	3.25	MINING		1.00	3,4,10,12-24	14000	COMPLETED PUSH
3.25	3.40	RING INSTALLATION	1090				
3.40	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.10	DELAY		-	-	-	INSTALL MESH AND LAGGING.
4.10	4.30	MINING		1.00	3,4,10,12-24	14000	COMPLETED PUSH
4.30	4.45	RING INSTALLATION	1091				
4.45	5.15	LUNCH					
5.15	5.45	MINING		-	-	-	INCOMPLETE PUSH
5.45	6.00	DELAY		-	-	-	INSTALL MESH AND LAGGING
6.00	6.10	MINING		1.00	3,4,10,12-24	14000	COMPLETED PUSH
6.10	6.25	RING INSTALLATION	1092				
6.25	6.55	MINING		-	-	-	INCOMPLETE PUSH
6.55	7.05	DELAY		-	-	-	INSTALL MESH AND LAGGING.
7.05	7.15	MINING		1.00	3-8,10,12-24	14000	COMPLETED PUSH
7.15	7.30	RING INSTALLATION	1093				
7.30	7.45	MINING		0.20	3-8,10,12-24	14000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					
8.00	14.38	MAINTENANCE & MINING		1.00	-	-	COMPLETED PUSH
		RING INSTALLATION	1094				
14.38	14.40	MINING		-	-	-	INCOMPLETE PUSH
14.40	14.54	DELAY		-	-	-	EXPAND RING #1093.
14.54	15.15	MINING		-	-	-	INCOMPLETE PUSH
15.15	15.22	DELAY		-	-	-	INSTALL MESH
15.22	15.35	MINING		1.00	1-4,10,12-24	12000	COMPLETED PUSH
15.35	15.45	RING INSTALLATION	1095				
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.30	RING INSTALLATION	1096				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 13,1984
Chainage :Start 1672.93 m
End 1687.33 m
Advance for day 14.40 m

File Name: DY07-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.30	17.10	MINING		1.00	3,4,10,12, 13-24	13000	-
17.10	17.15	DELAY					INSTALL MESH
17.15	17.30	RING INSTALLATION	1097				
17.30	17.45	MINING		-	-	-	INCOMPLETE PUSH
17.45	18.00	DELAY					INSTALL SPACERS ON RING #1095 & EXPAND
18.00	18.25	MINING		1.00	3,4,10,12, 13-24	12000	COMPLETED PUSH
18.25	18.35	RING INSTALLATION	1098				
18.35	18.45	DELAY					NO MESH PANELS AVAILABLE AT FACE
18.45	19.12	DELAY					INSTALL MESH & SPACERS ON RING #1096
19.12	19.50	MINING		1.00	3,4,10,12, 13-24	12000	-
19.50	20.00	DELAY					INSTALL MESH
20.00	20.30	LUNCH					
20.30	20.45	RING INSTALLATION	1099				
20.45	21.00	DELAY					INSTALL SPACERS ON RING #1097
21.00	21.30	MINING		1.00	3,4,10,12, 13-24	12000	-
21.30	21.40	RING INSTALLATION	1100				
21.40	21.54	DELAY					INSTALL SPACERS ON RING #1098
21.54	22.37	MINING		1.00	3,4,10,12 13-24	12000	-
22.37	22.48	RING INSTALLATION	1101				
22.48	23.00	DELAY					INSTALL SPACERS ON RING #1098
23.00	23.45	MINING		1.00	3,4,10,12, 13-24	12000	-
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 14,1984 File Name: DY07-14A
Chainage :Start 1687.33 m
End 1692.93 m Project No: 831-6014
Advance for day 5.60 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.50	DELAY					EXPAND RING #1100 WITH SPECIAL SPACERS
0.50	1.05	RING INSTALLATION	1102				
1.05	1.45	MINING		1.00	3,4,11-24	12000	-
1.45	2.15	DELAY					EXPAND RING #1101 WITH SPECIAL SPACERS
		RING INSTALLATION	1103				
2.15	2.50	MINING		1.00	3-8,11-24	12000	-
2.50	3.05	RING INSTALLATION	1104				
3.05	3.20	DELAY					EXPAND RING #1102 WITH SPECIAL SPACERS
3.20	3.40	MINING		-	-	-	INCOMPLETE PUSH
3.40	3.45	DELAY					PRIME WATERPUMPS FOR WATER SPRAYS
3.45	3.50	DELAY					INSTALL MESH
3.50	4.10	MINING		1.00	3-8,11-24	11000	COMPLETED PUSH
4.10	4.20	DELAY					EXPAND RING #1103 WITH SPECIAL SPACERS
4.20	4.35	RING INSTALLATION	1105				
4.35	5.05	LUNCH					
5.05	5.45	MINING		1.00	3,4,11-24	11000	-
5.45	6.00	RING INSTALLATION	1106				
6.00	6.40	MINING		1.00	3,4,11-24	11000	-
6.40	6.55	DELAY					EXPAND RING #1105 WITH SPECIAL SPACERS
6.55	7.10	RING INSTALLATION	1107				
7.10	7.30	MINING		0.60	3,4,11-24	11000	INCOMPLETE PUSH
7.30	7.45	DELAY					INSTALL MESH
7.45	8.00	-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 16,1984
Chainage :Start 1693.96 m
End 1701.45 m
Advance for day 7.49 m

File Name: DY07-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #22.42B.43A.
12.00	12.30	LUNCH					
12.30	13.45	MAINTENANCE					END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #1105 WITH 4 SETS OF PINS
							RESPLICE PRIMARY CONVEYOR
							RESPLICE MAIN CONVEYOR (2 LOCATIONS)
13.45	14.00	MINING		0.50	3-8,13-24	7500	COMPLETED PUSH
14.00	14.20	RING INSTALLATION	1108				
14.20	14.34	MINING		-	-	-	INCOMPLETE PUSH
14.34	14.43	DELAY					PRIME PUMPS FOR WATERSPRAYS (NO WATER)
14.43	15.12	MINING		1.00	3-8,13-24	7500	COMPLETED PUSH
15.12	15.30	RING INSTALLATION	1109				
15.30	15.45	MINING		0.30	3-8,13-24	7500	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.30	MINING		-	-	-	INCOMPLETE PUSH
16.30	16.45	DELAY					INSTALL MESH & LAGGING
16.45	17.00	MINING		0.70	3,4,12-24	9000	COMPLETED PUSH
17.00	17.15	DELAY					EXPAND RING #1108
17.15	17.30	RING INSTALLATION	1110				
17.30	18.00	MINING		0.70	3,4,12-24	9000	-
18.00	18.15	DELAY					EXPAND RING #1109
18.15	18.30	RING INSTALLATION	1111				
18.30	19.05	MINING		0.90	3-8,12-24	9000	-
19.05	19.20	DELAY					EXPAND RING #1110
19.20	19.35	RING INSTALLATION	1112				
19.35	20.10	MINING		1.00	3-8,12-24	10000	-
20.10	20.20	DELAY					EXPAND RING #1111
20.20	20.30	RING INSTALLATION	1113				
20.30	21.00	LUNCH					
21.00	21.40	MINING		1.00	3-8,12-24	10000	-
21.40	22.10	DELAY					EXPAND RING #1112
22.10	22.25	RING INSTALLATION	1114				
22.25	23.05	MINING		1.00	3-8,12-24	9000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 16,1984
Chainage :Start 1693.96 m
End 1701.45 m
Advance for day 7.49 m

File Name: DY07-16A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
23.05	23.15	DELAY					EXPAND RING #1113
23.15	23.25	RING INSTALLATION	1115				
23.25	23.45	MINING		0.50	3-8,12-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 17,1984 File Name: DY07-17A
Chainage :Start 1701.45 m
End 1715.65 m Project No: 831-6014
Advance for day 14.20 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	0.51	MINING		0.90	3-8,13-24	10500	COMPLETED PUSH
0.51	1.22	RING INSTALLATION	1116				EXPAND RING #1114,INSTALL FILLER PLATES
1.22	2.03	MINING		1.00	3-8,13-24	10-11000	-
2.03	2.35	RING INSTALLATION	1117				EXPAND RING #1115,INSTALL FILLER PLATES
2.35	3.15	MINING		1.00	3-8,13-24	10-11000	-
3.15	3.37	RING INSTALLATION	1118				
3.37	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.49	MINING		1.00	3-8,13-24	10500	COMPLETED PUSH
4.49	5.14	RING INSTALLATION	1119				
5.14	5.50	MINING		1.00	5-8,13-24	11000	-
5.50	6.23	RING INSTALLATION	1120				
6.23	6.58	MINING		1.00	5-8,13-24	10500	-
6.58	7.30	RING INSTALLATION	1121				
7.30	7.42	MINING		0.20	5-8,13-24	10500	INCOMPLETE PUSH
7.42	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE					CHANGED 4 CUTTERS (NO REPORT)
							PINNED RING #1118 WITH 4 SETS OF PINS
12.00	12.30	LUNCH					
12.30	13.45	MAINTENANCE					END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
13.45	14.20	MINING		0.80	5-8,13-24	10000	COMPLETED PUSH
14.20	14.40	RING INSTALLATION	1122				
14.40	15.15	MINING		1.00	5-8,13-24	10000	-
15.15	15.28	RING INSTALLATION	1123				
15.28	15.45	MINING		0.50	5-8,13-24	10000	INCOMPLETE PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.45	DELAY					EXPND RING #1121,INSTALL MESH & LAGGING
16.45	17.20	DELAY					POWER TROUBLE(NO.1&2 MAIN DRIVE MOTORS)
17.20	17.35	MINING		0.25	3-8,12-24	12000	COMPLETED PUSH
17.35	17.40	DELAY					EXPAND RING #1122
17.40	17.50	RING INSTALLATION	1124				
17.50	18.45	MINING		1.00	3,4,13-24	12000	-
18.45	18.50	DELAY					EXPAND RING #1123
18.50	19.00	RING INSTALLATION	1125				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 17,1984
Chainage :Start 1701.45 m
End 1715.65 m
Advance for day 14.20 m

File Name: DY07-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.00	19.40	MINING		1.00	3,4,13-24	13000	-
19.40	20.10	LUNCH					
20.10	20.15	DELAY					EXPAND RING #1124
20.15	20.30	RING INSTALLATION	1126				
20.30	21.10	MINING		1.00	3-8,12-24	13000	-
21.10	21.15	DELAY					EXPAND RING #1125
21.15	21.25	RING INSTALLATION	1127				
21.25	22.05	MINING		1.15	3-8,13-24	13000	-
22.05	22.10	DELAY					EXPAND RING #1126
22.10	22.25	RING INSTALLATION	1128				
22.25	23.00	MINING		0.90	3-8,10,12, 17-24	13000	-
23.00	23.10	DELAY					EXPAND RING #1127
23.10	23.25	RING INSTALLATION	1129				
23.25	23.45	MINING		0.50	3-8,10,12, 17-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY07-1BA

Date JULY 18,1984
Chainage :Start 1715.65 m
End 1727.90 m
Advance for day 12.25 m

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.47	MINING		0.70	3-8,13-24	11000	COMPLETED PUSH
0.47	1.16	RING INSTALLATION	1130				
1.16	1.59	MINING		1.00	3,4,5,8.5,10, 12,13-24	11000	-
1.59	2.26	RING INSTALLATION	1131				
2.26	3.02	MINING		1.00	3,4,10,12, 13-24	12500	-
3.02	3.37	RING INSTALLATION	1132				
3.37	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.54	MINING		1.00	3-8,10,12, 13-24	12000	COMPLETED PUSH
4.54	5.26	RING INSTALLATION	1133				
5.26	6.15	MINING		1.00	3-8,10,12, 13-24	12500	-
6.15	6.58	RING INSTALLATION	1134				
6.58	7.23	MINING		0.70	3-8,10,12, 13-24	12500	INCOMPLETE PUSH
7.23	7.45	DELAY					POWER LOSS TO T.B.M.
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #12,19,38,42B,43A. PINNED RING #1132 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.00	MAINTENANCE		-	-	-	END CUTTER CHANGE BELT LOCKED OUT
15.00	15.20	DELAY					
15.20	15.37	MINING		0.30	3-8,13-16, 21-24	14000	COMPLETED PUSH
15.37	15.45	RING INSTALLATION	1135	-	-	-	PARTIAL INSTALLATION
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.45	RING INSTALLATION	1135	-	-	-	COMPLETE INSTALLATION,EXPAND RING #1133
16.45	17.15	MINING		0.75	3-8,12-24	12000	COMPLETED PUSH EXPAND RING #1134
17.15	17.20	DELAY					
17.20	17.35	RING INSTALLATION	1136				
17.35	18.10	MINING		1.00	3,4,11-24	12000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 18,1984
Chainage :Start 1715.65 m
End 1727.90 m
Advance for day 12.25 m

File Name: DY07-18A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.10	18.15	DELAY					EXPAND RING #1135
18.15	18.30	RING INSTALLATION	1137				
18.30	19.05	MINING		1.00	3,4,11-24	12000	-
19.05	19.10	DELAY					EXPAND RING #1136
19.10	19.20	RING INSTALLATION	1138				
19.20	20.05	MINING		1.00	3,4,13-24	12000	-
20.05	20.10	DELAY					EXPAND RING #1137
20.10	20.25	RING INSTALLATION	1139				
20.25	20.55	LUNCH					
20.55	21.35	MINING		1.00	3,4,11-24	11000	-
21.35	21.40	DELAY					EXPAND RING #1138
21.40	21.55	RING INSTALLATION	1140				
21.55	22.35	MINING		1.00	3,4,13-24	11000	-
22.35	22.40	DELAY					EXPAND RING #1139
22.40	22.55	RING INSTALLATION	1141				
22.55	23.45	MINING		0.80	3,4,13-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 19,1984 File Name: DY07-19A
Chainage :Start 1727.90 m
End 1739.53 m Project No: 831-6014
Advance for day 11.63 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.36	MINING		0.45	3,4,10,12, 13-24	12500	COMPLETED PUSH
0.36	0.59	RING INSTALLATION	1142				
0.59	1.42	MINING		1.00	3,4,10,12, 13-24	12500	-
1.42	2.00	RING INSTALLATION	1143				
2.00	2.26	MINING		-	-	-	INCOMPLETE PUSH
2.26	2.40	DELAY					NO.1 MAIN DRIVE SHUT DOWN
2.40	2.50	MINING		1.00	3,4,10,12, 13-24	12500	COMPLETED PUSH
2.50	3.08	RING INSTALLATION	1144				
3.08	3.37	MINING		-	-	-	INCOMPLETE PUSH
3.37	4.00	DELAY					NO.1 MAIN DRIVE TROUBLE
4.00	4.30	LUNCH					
4.30	4.49	MINING		0.93	3,4,10,12, 13-24	13000	COMPLETED PUSH
4.49	5.07	RING INSTALLATION	1145				
5.07	5.51	MINING		1.00	3,4,9-24	13000	-
5.51	6.11	RING INSTALLATION	1146				
6.11	6.54	MINING		1.00	3,4,5-8.5,10, 12,13-24	12500	-
6.54	7.18	DELAY					INSTALL MESH
7.18	7.34	RING INSTALLATION	1147				
7.34	7.43	MINING		-	-	-	INCOMPLETE PUSH
7.43	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #18,28,39,42A,43B. PINNED RING #1144 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.15	MAINTENANCE		-	-	-	RESPLICE MAIN CONVEYOR(2 SPLICES)
14.15	15.00	MINING		1.00	3-8,13-24	14000	COMPLETED PUSH
15.00	15.12	RING INSTALLATION	1148				
15.12	15.45	DELAY					REPAIR WATERPUMP(NO WATER @ CUTTERHEAD)
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.15	DELAY					END REPAIR OF WATER PUMP

Notes: RING INSTALLATION TIME MAY ALSO INCLUDE EXPANSION OF PREVIOUSLY INSTALLED RING

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 19,1984
Chainage :Start 1727.90 m
End 1739.53 m
Advance for day 11.63 m

File Name: DY07-19A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
17.15	17.55	MINING		0.80	3-8,10,11, 17-24	12000	-
17.55	18.00	DELAY					EXPAND RING #1147
18.00	18.15	RING INSTALLATION	1149				
18.15	19.00	MINING		1.00	3-8,11,12, 17-24	12000	-
19.00	19.10	DELAY					EXPAND RING #1148
19.10	19.25	RING INSTALLATION	1150				
19.25	20.10	MINING		1.00	3-8,11,12, 17-24	14000	-
20.10	20.15	DELAY					EXPAND RING #1149
20.15	20.30	RING INSTALLATION	1151				
20.30	21.00	LUNCH					
21.00	21.45	MINING		1.00	3-8,11,12, 17-24	14000	-
21.45	22.00	DELAY					EXPAND RING #1150 & INSTALL MESH
22.00	22.15	RING INSTALLATION	1152				
22.15	23.00	MINING		1.00	3-8,11,12, 17-24	14000	-
23.00	23.10	DELAY					EXPAND RING #1151
23.10	23.25	RING INSTALLATION	1153				
23.25	23.45	MINING		0.45	3-8,11,12, 17-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 20,1984
Chainage :Start 1739.53 m
End 1751.28 m
Advance for day 11.75 m

File Name: DY07-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.52	MINING		0.75	3-12,17-24	14000	COMPLETED PUSH
0.52	1.24	RING INSTALLATION	1154				
1.24	2.08	MINING		1.00	3-12,17-24	14500	-
2.08	2.31	RING INSTALLATION	1155				
2.31	3.13	MINING		1.00	3-12,17-24	14-15000	-
3.13	3.35	RING INSTALLATION	1156				PARTIAL INSTALLATION
3.35	4.30	LUNCH & DELAY		-	-	-	SEVERED HYDRLC HOSE(CONTROL RTRN LINE)
4.30	4.38	RING INSTALLATION	1156				COMPLETE INSTALLATION
4.38	5.24	MINING		1.00	3-12,17-24	15000	-
5.24	5.52	RING INSTALLATION	1157				
5.52	6.38	MINING		1.00	3-12,17-24	14000	-
6.38	7.13	DELAY					INSTALL MESH & LAGGING,EXPAND RING#1156
7.13	7.23	RING INSTALLATION	1158				
7.23	7.45	MINING		0.40	3-8,10,12, 13-24	14000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #14,39,42B,43A. PINNED RING #1156 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.55	MAINTENANCE		-	-	-	RESPLICE MAIN CONVEYOR BELT(2 SPLICES)
14.55	15.11	MINING		-	-	-	INCOMPLETE PUSH
15.11	15.35	DELAY					INSTALL MESH
15.35	15.45	MINING		0.60	3-8,13-16, 21-24	12000	COMPLETED PUSH
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.45	DELAY		-	-	-	INSTALL MESH & EXPAND RING #1157
16.45	17.00	RING INSTALLATION	1159				
17.00	17.20	MINING		-	-	-	INCOMPLETE PUSH
17.20	17.35	DELAY					INSTALL MESH
17.35	17.50	MINING		0.80	3-8,12,14,16, 17-24	12000	COMPLETED PUSH
17.50	18.00	DELAY					EXPAND RING #1158
18.00	18.15	RING INSTALLATION	1160				
18.15	18.50	MINING		1.00	3,4,11-24	12000	-

Notes: RING INSTALLATION TIME MAY ALSO INCLUDE EXPANSION OF PREVIOUSLY INSTALLED RING

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 20,1984
Chainage :Start 1739.53 m
End 1751.28 m
Advance for day 11.75 m

File Name: DY07-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.50	19.05	DELAY					INSTALL MESH & EXPAND RING #1159
19.05	19.20	RING INSTALLATION	1161				
19.20	19.50	MINING		1.00	3,4,11-24	12000	-
19.50	19.55	DELAY					EXPAND RING #1160
19.55	20.10	RING INSTALLATION	1162				
20.10	20.40	LUNCH					
20.40	21.20	MINING		1.00	3-8,12-24	12000	-
21.20	21.30	DELAY					EXPAND RING #1161
21.30	21.45	RING INSTALLATION	1163				
21.45	22.25	MINING		1.00	3-8,12-24	12000	-
22.25	22.30	DELAY					EXPAND RING #1162
22.30	22.45	RING INSTALLATION	1164				
22.45	23.10	MINING		-	-	-	INCOMPLETE PUSH
23.10	23.20	DELAY					INSTALL MESH
23.20	23.45	MINING		1.20	3,4,11-24	12000	COMPLETED PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 21,1984
Chainage :Start 1751.28 m
End 1756.53 m
Advance for day 5.25 m

File Name: DY07-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.38	RING INSTALLATION	1165				
0.38	1.18	MINING		1.00	3-8,13-24	11000	T.B.M. CUT OUT 3 TIMES
1.18	1.39	RING INSTALLATION	1166				
1.39	1.46	MINING		-	-	-	INCOMPLETE PUSH
1.46	2.01	DELAY					INSTALLED DIODE ON CONVEYOR PANEL
2.01	2.29	MINING		1.00	3-8,13-24	10500	COMPLETED PUSH
2.29	2.54	RING INSTALLATION	1167				
2.54	3.37	MINING		1.00	3,4,13-24	12000	-
3.37	4.00	RING INSTALLATION	1168				
4.00	4.30	LUNCH					
4.30	5.11	MINING		1.00	3,4,13-24	11.5-12000	-
5.11	6.00	RING INSTALLATION	1169				
6.00	6.55	MINING		1.00	3,4,10,12,13, 15,17-24	13500	-
6.55	7.26	RING INSTALLATION	1170				
7.26	7.45	MINING		0.25	3,4,13-24	12000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes: RING INSTALLATION TIME MAY ALSO INCLUDE EXPANSION OF PREVIOUSLY INSTALLED RING.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 22,1984 File Name: DY07-22A
Chainage :Start 1756.53 m
End 1761.28 m Project No: 831-6014
Advance for day 4.75 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	8.40	DELAY		-	-	-	EXTEND WATERLINE 40 FT. BEFORE MINING
8.40	8.50	MINING		-	-	-	INCOMPLETE PUSH
8.50	9.00	DELAY					INSTALL MESH
9.00	9.15	MINING		0.75	3,4,12-24	13000	COMPLETED PUSH
9.15	9.30	DELAY					EXPAND RING #1169
9.30	9.45	RING INSTALLATION	1171				
9.45	10.20	MINING		-	-	-	
10.20	10.30	DELAY					INSTALL MESH
10.30	10.45	DELAY					EXPAND RING #1170
10.45	10.50	MINING		1.00	3,4,12-24	13000	COMPLETED PUSH
10.50	11.35	DELAY					WAIT FOR MATERIAL(DERAILMENT @ S TURN)
11.35	11.50	RING INSTALLATION	1172				
11.50	12.15	MINING		-	-	-	INCOMPLETE PUSH
12.15	12.45	LUNCH					
12.45	13.00	MINING		-	-	-	INCOMPLETE PUSH
13.00	13.10	DELAY					EXPAND RING #1171
13.10	13.25	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
13.25	13.35	RING INSTALLATION	1173				
13.35	13.45	DELAY					NO.2 MAIN CONVEYOR STOPPED TO CUT OUT A PIECE OF TORN BELT.
13.45	14.05	MINING		-	-	-	INCOMPLETE PUSH
14.05	14.45	DELAY					NO WATER @ T.B.M.:FIX PRESS.CNTRL VALVE
14.45	14.50	MINING		-	-	-	INCOMPLETE PUSH
14.50	15.00	DELAY					EXPAND RING #1172
15.00	15.15	DELAY					CLEAN 6 WATER SPRAYS IN CUTTERHEAD
15.15	15.45	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
15.45	16.00	-- SHIFT CHANGE------					END OF DAYS WORK

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date JULY 23,1984
Chainage :Start 1761.08 m
End 1768.58 m
Advance for day 7.50 m

File Name: DY07-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					-
8.00	8.15	-- SHIFT CHANGE------					
8.00	15.45	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGE 4 CUTTERS
15.45	16.15	-- SHIFT CHANGE------					
		RING INSTALLATION	1174				
16.15	17.22	MINING		1.50	3,4,13-24	13000	-
17.22	17.35	RING INSTALLATION	1175				
17.35	18.25	MINING		1.50	3,4,13-24	13000	-
18.25	18.40	DELAY					INSTALL MESH & EXPAND RING @1174
18.40	18.55	RING INSTALLATION	1176				
18.55	19.45	MINING		1.50	3,4,13-24	13000	-
19.45	20.00	RING INSTALLATION	1177				
20.00	20.30	LUNCH					
20.30	21.22	MINING		1.50	3,4,13-24	13000	-
21.22	21.40	RING INSTALLATION	1178				
21.40	22.28	MINING		1.50	3,4,13-24	13000	-
22.28	22.45	RING INSTALLATION	1179				
22.45	23.45	DELAY		-	-	-	NO.1 BELT DOWN, TAIL ROLLER JAMMED WITH MUCK. CLEAN & REMOVE SLACK FROM BELT.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 24,1984
Chainage :Start 1768.58 m
End 1777.58 m
Advance for day 9.00 m

File Name: DY07-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	DELAY					ADJUST TENSION(NO.1 & 2 MAIN CONVEYORS)
0.15	0.28	-- SHIFT CHANGE------					
0.28	1.23	MINING		1.50	3,4,12-24	10000	-
1.23	1.38	RING INSTALLATION	1180				ALSO EXPAND RING #1178
1.38	1.58	MINING		-	-	-	INCOMPLETE PUSH
1.58	3.35	DELAY					NO.1 MAIN CONVEYOR OFF
3.35	3.50	MINING		-	-	-	INCOMPLETE PUSH
3.50	6.15	DELAY					NO.1 MAIN CONVEYOR OFF
6.15	6.30	MINING		1.50	3,4,12-24	10000	COMPLETED PUSH
6.30	6.40	RING INSTALLATION	1181				ALSO EXPAND RING #1179
6.40	7.35	MINING		1.50	3,4,13-24	10000	-
7.35	7.45	RING INSTALLATION	1182				ALSO EXPAND RING #1180
7.45	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE		-	-	-	CHANGED CUTTERS #22,32,42B,43A. ASSORTED MACHINE MAINTENANCE
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.05	MINING		1.50	3,4,13-24	10000	-
17.05	17.15	DELAY					EXPAND RING #1181
17.15	17.25	RING INSTALLATION	1183				
17.25	18.12	MINING		1.50	3,4,13-24	10000	-
18.12	18.20	DELAY					EXPAND RING #1182
18.20	18.30	RING INSTALLATION	1184				
18.30	19.20	MINING		1.50	3,4,13-24	10000	-
19.20	19.35	RING INSTALLATION	1185				
19.35	20.00	DELAY					WORK ON BELT & PLUG VOID IN BACK
20.00	20.30	LUNCH					
20.30	23.45	DELAY		-	-	-	COMPLETE INSTLTN(METAL PANELS IN VOID)
							PUMP AEROSTEM INTO VOID
							PULL NO.3 BELT THROUGH NO.3 DRIVE
		-- SHIFT CHANGE------					

Notes: RING INSTALLATION TIME MAY INCLUDE EXPANSION OF PREVIOUSLY INSTALLED RING

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 25,1984
Chainage :Start 1777.58 m
End 1789.88 m
Advance for day 12.30 m

File Name: DY07-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	3.20	DELAY					PUMP 50 BAGS OF CAVITY FILLING COMPOUND INTO VOID OVER RING #1057-1061. INSTALLED BELT ON NO.3 CONVEYOR
3.20	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.50	MINING		1.50	3,4,13-24	9000	COMPLETED PUSH
4.50	5.05	RING INSTALLATION	1186				
5.05	6.00	MINING		1.50	3,4,13-24	9000	-
6.00	6.15	RING INSTALLATION	1187				
6.15	7.05	MINING		1.50	3,4,13-24	11000	-
7.05	7.15	RING INSTALLATION	1188				
7.15	7.20	MINING		-	-	-	INCOMPLETE PUSH
7.20	7.30	DELAY					CONVEYOR STOPPED
7.30	7.45	MINING		0.50	3,4,13-24	10000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE		-	-	-	CHANGED CUTTERS #6,20,31,34,42A,43B. ASSORTED MACHINE MAINTENANCE
15.45	16.18	-- SHIFT CHANGE------					
16.18	16.56	MINING		1.00	5,7,9,11,13-24	8000	COMPLETED PUSH
16.56	17.15	RING INSTALLATION	1189				
17.15	18.02	MINING		1.50	5,7,9,11,13-24	8000	-
18.02	18.15	RING INSTALLATION	1190				
18.15	19.05	MINING		1.50	5,7,9,11,13-24	8000	-
19.05	19.25	RING INSTALLATION	1191				
19.25	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.40	DELAY					RE-SET MAIN CONVEYOR
20.40	20.53	MINING		1.50	5,7,9,11,13-24	8000	COMPLETED PUSH
20.53	21.15	RING INSTALLATION	1192				
21.15	21.55	MINING		-	-	-	INCOMPLETE PUSH
21.55	22.45	DELAY					RE-ALIGN & ANCHOR NO.3 TAIL ROLLER
22.45	23.15	MINING		1.50	5,7,9,11,13-24	8000	-
23.15	23.30	RING INSTALLATION	1193				
23.30	23.45	MINING		0.30	5,7,9,11,13-24	8000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 26,1984
Chainage :Start 1789.88 m
End 1798.58 m
Advance for day 8.70 m

File Name: DY07-26A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.25	-- SHIFT CHANGE------					
0.25	1.10	MINING		1.20	3,4,11,13-24	10000	COMPLETED PUSH
1.10	1.20	RING INSTALLATION	1194				
1.20	1.30	DELAY					EXTEND WATER LINE
1.30	2.20	MINING		1.50	3-8,17-24	10000	-
2.20	2.35	RING INSTALLATION	1195				
2.35	3.25	MINING		1.50	3-8,17-24	10000	-
3.25	3.40	RING INSTALLATION	1196				
3.40	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.10	MINING		1.50	3-8,17-24	14000	COMPLETED PUSH
5.10	5.25	RING INSTALLATION	1197				
5.25	5.40	MINING		-	-	-	INCOMPLETE PUSH
5.40	6.05	DELAY					CONVEYOR STOPPED (CHUTE PLUGGED)
6.05	6.20	MINING		-	-	-	INCOMPLETE PUSH
6.20	7.00	DELAY					SCNDRY BELT SLIPPING (CHUTE PLUGGED)
7.00	7.35	MINING		1.50	3-8,17-24	13000	COMPLETED PUSH
7.35	7.45	RING INSTALLATION	1198				
7.45	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE & DELAY		-	-	-	CHANGE CUTTERS #15,24,42A,43B.
							ASSORTED MACHINE MAINTENANCE
							REPAIR SPLICE IN NO.1 MAIN BELT
							NO MINING DUE TO BROKEN BOLTS IN CUTTER
15.45	16.15	-- SHIFT CHANGE------					
16.15	20.00	DELAY		-	-	-	REMOVE BROKEN BOLTS FROM CENTRE CUTTERS
20.00	20.30	LUNCH					
20.30	22.35	DELAY		-	-	-	END BOLT REMOVAL & CHANGE CENTRE CUTTER
22.35	23.45	MINING		1.50	1,3,9,11,13-24	6000	-
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 27,1984
Chainage :Start 1798.58 m
End 1810.58 m
Advance for day 12.00 m

File Name: DY07-27A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
		RING INSTALLATION	1199				
0.20	1.15	MINING		1.50	3,4,12,14, 16-24	10000	-
1.15	1.25	RING INSTALLATION	1200				
1.25	2.20	MINING		1.50	3,4,12,14, 16-24	10000	-
2.20	2.30	RING INSTALLATION	1201				
2.30	3.25	MINING		1.50	3,4,12,14, 16-24	10000	-
3.25	3.35	RING INSTALLATION	1202				
3.35	3.45	MINING		-	-	-	INCOMPLETE PUSH
3.45	3.55	DELAY					CHUTE PLUGGED
3.55	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.10	MINING		1.50	3,4,13-24	10000	COMPLETED PUSH
5.10	5.20	RING INSTALLATION	1203				
5.20	6.10	MINING		1.50	3,4,11-24	10000	-
6.10	6.20	RING INSTALLATION	1204				
6.20	7.45	DELAY		-	-	-	REMOVE NO.3 MAIN CONVEYOR MOTOR (BEARING OVERHEATED)
7.45	8.15	-- SHIFT CHANGE------					
8.15	15.45	MAINTENANCE		-	-	-	CHANGED 4 CUTTERS ASSORTED MACHINE MAINTENANCE
15.45	16.15	-- SHIFT CHANGE------					
16.15	17.45	DELAY		-	-	-	LINE UP NO.3 DRIVE MOTOR
17.45	18.45	DELAY					NO.3 DRIVE MOTOR ELECTRICAL PROBLEMS
18.45	19.30	DELAY					SECONDARY BELT ELECTRICAL PROBLEMS
19.30	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.45	MINING		1.50	1-8,13-16, 21-24	7500	COMPLETED PUSH
20.45	21.00	RING INSTALLATION	1205				
21.00	22.03	MINING		1.50	1-8,13-16, 21-24	7500	-
22.03	22.20	RING INSTALLATION	1206				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 27,1984
Chainage :Start 1798.58 m
End 1810.58 m
Advance for day 12.00 m

File Name: DY07-27A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
22.20	23.25	MINING		1.50	1-8,13-16, 21-24	7500	-
23.25	23.45	RING INSTALLATION -- SHIFT CHANGE------	1207				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date JULY 28,1984
Chainage :Start 1810.58 m
End 1817.68 m
Advance for day 7.10 m

File Name: DY07-28A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.30	DELAY					CHECK WATER SPRAYS
0.30	1.25	MINING		1.50	3-8,13-24	10000	-
1.25	1.40	RING INSTALLATION	1208				
1.40	2.30	MINING		-	-	-	INCOMPLETE PUSH
2.30	3.05	DELAY					NO.3 MAIN CONVEYOR STOPPED
3.05	3.10	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
3.10	3.20	RING INSTALLATION	1209				
3.20	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.50	MINING		1.50	3-8,11,17-24	12000	COMPLETED PUSH
4.50	5.00	RING INSTALLATION	1210				
5.00	6.15	MINING		1.50	3,4,13-24	14000	-
6.15	6.30	RING INSTALLATION	1211				
6.30	7.00	MINING		-	-	-	INCOMPLETE PUSH
7.00	7.20	DELAY					CONVEYOR STOPPED (SECONDARY BELT)
7.20	7.45	MINING		1.10	3-8,13-24	14000	COMPLETED PUSH
7.45	8.00	-- SHIFT CHANGE------					END OF DAYS WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 30,1984
Chainage :Start 1817.45 m
End 1820.90 m
Advance for day 3.45 m

File Name: DY07-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	10.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #12,19,42B,43A. ASSORTED MACHINE MAINTENANCE
10.00	10.15	DELAY					COFFEE BREAK
10.15	12.00	MAINTENANCE					CONTINUE CUTTER CHANGE
12.00	12.30	LUNCH					
12.30	13.15	MAINTENANCE					END CUTTER CHANGE
13.15	14.15	MINING		0.21	1,2,5,6,13,16, 17,20,21,24	17500	INCOMPLETE PUSH
14.15	15.45	DELAY					REPAIR FITTING ON RAM NO.13
15.45	16.35	-- SHIFT CHANGE------					CREW WALKED DOWN TUNNEL, NO SIGNALS TO HOIST.
16.35	17.50	MINING		0.24	3-8,11,13-24	14000	COMPLETED PUSH
17.50	18.05	RING INSTALLATION	1212				
18.05	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.40	MINING		1.50	3,8,11,13-24	15000	COMPLETED PUSH
20.40	20.50	RING INSTALLATION	1213				
20.50	21.55	MINING		1.50	3-8,12-24	15000	-
21.55	22.10	RING INSTALLATION	1214				
22.10	23.45	DELAY					REMOVE FLEX PLATE FROM NO.3 MAIN CONVEYOR DRIVE MOTOR (SHATTERED)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 31,1984
Chainage :Start 1820.90 m
End 1831.90 m
Advance for day 11.00 m

File Name: DY07-31A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	4.00	DELAY		-	-	-	REMOVE FLEIPLATE FROM FLUID COUPLING
4.00	4.30	LUNCH					
4.30	7.45	DELAY & MAINTENANCE		-	-	-	INSTALL NEW FLEIPLATE & START TO LINE UP COUPLING & MOTOR
							PINNED RING #1212 WITH 4 SETS OF PINS
							END DRILLING OF NO.16 MANWAY
7.45	8.15	-- SHIFT CHANGE------					
8.15	10.00	DELAY		-	-	-	COUPLE NO.3 DRIVE MOTOR
10.00	10.15	DELAY					COFFEE BREAK
10.15	12.00	DELAY		-	-	-	COUPLE NO.3 MOTOR DRIVE
12.00	12.30	LUNCH					
12.30	14.23	MINING		1.50	1-3,6,9,13,16, 17,20,21,24	14000	-
14.23	14.42	RING INSTALLATION	1215				
14.42	14.50	DELAY					NO WATER AT T.B.M.
14.50	15.03	MINING		-	-	-	INCOMPLETE PUSH
15.03	15.10	DELAY					
15.10	15.43	MINING		1.32	2,3,6,7,9-11, 13,16,17,20, 21,24	14000	INCOMPLETE PUSH
15.43	16.20	-- SHIFT CHANGE------					
16.20	16.30	MINING		0.18	3-8,12-24	14000	COMPLETED PUSH
16.30	16.45	RING INSTALLATION	1216				
16.45	17.45	MINING		1.50	3-8,12-24	14000	-
17.45	18.00	RING INSTALLATION	1217				
18.00	19.00	MINING		1.50	3-8,12-24	15000	-
19.00	19.15	RING INSTALLATION	1218				
19.15	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.45	MINING		1.50	3-8,12-24	15000	COMPLETED PUSH
20.45	21.00	RING INSTALLATION	1219				
21.00	21.55	MINING		1.50	3-8,11-24	15000	-
21.55	22.10	RING INSTALLATION	1220				
22.10	23.10	MINING		1.50	3-8,12-24	14000	-
23.10	23.25	RING INSTALLATION	1221				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date JULY 31,1984
Chainage :Start 1820.90 m
End 1831.90 m
Advance for day 11.00 m

File Name: DY07-31A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.25	23.45	MINING -- SHIFT CHANGE------		0.50	3,4,11-24	15000	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 01,1984
Chainage :Start 1831.90 m
End 1845.15 m
Advance for day 13.25 m

File Name: DY08-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	0.40	MINING		-	-	-	INCOMPLETE PUSH
0.40	0.55	DELAY					INSTALL MESH & EXPAND RING #1220
0.55	1.30	MINING		-	-	-	INCOMPLETE PUSH
1.30	3.43	DELAY					CHANGE & ADJUST SCRAPERS ON T.B.M.
3.43	4.02	MINING		1.00	3,4,9-24	16000	COMPLETED PUSH
4.02	4.20	RING INSTALLATION	1222				
4.20	4.50	LUNCH					
4.50	5.35	MINING		-	-	-	INCOMPLETE PUSH
5.35	5.43	DELAY					EXPAND RING #1221
5.43	6.00	MINING		1.50	3,4,9-24	16000	COMPLETED PUSH
6.00	6.15	RING INSTALLATION	1223				
6.15	6.55	MINING		-	-	-	INCOMPLETE PUSH
6.55	7.07	DELAY					EXPAND RING #1222
7.07	7.20	MINING		1.50	3,4,9-24	16000	COMPLETED PUSH
7.20	7.45	RING INSTALLATION	1224				INSTRUMENTATION RING
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #13,27,42A,43A.
12.00	12.30	LUNCH					
12.30	14.15	MAINTENANCE		-	-	-	END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
14.15	14.33	MINING		-	-	12500	INCOMPLETE PUSH
14.33	14.45	DELAY					INSTALL MESH & LAGGING
14.45	15.17	MINING		1.50	2,3,5,6,9,16, 19,20,23,24	11000	COMPLETED PUSH
15.17	15.45	RING INSTALLATION	1225				PARTIAL INSTALLATION
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.35	RING INSTALLATION	1225				COMPLETE INSTALLATION
16.35	17.30	MINING		1.50	1-11,13-24	14000	-
17.30	17.40	RING INSTALLATION	1226				
17.40	18.35	MINING		1.50	3,4,11-13, 15-24	14000	-
18.35	18.45	RING INSTALLATION	1227				
18.45	19.15	MINING		-	-	-	INCOMPLETE PUSH
19.15	20.00	DELAY					PRIMARY BELT STOPPED(STONE SPILL IN NO.3 CONVEYOR TAIL ROLLER)

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 01,1984
Chainage :Start 1831.90 m
End 1845.15 m
Advance for day 13.25 m

File Name: DY08-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.00	20.30	LUNCH					
20.30	20.55	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
20.55	21.05	RING INSTALLATION	1228				
21.05	22.05	MINING		1.50	3-8,13-24	10000	-
22.05	22.15	RING INSTALLATION	1229				
22.15	23.15	MINING		1.50	3,4,12-24	14000	-
23.15	23.27	RING INSTALLATION	1230				
23.27	23.35	MINING		0.25	3,4,12-24	14000	INCOMPLETE PUSH
23.35	23.45	DELAY					INSTALL MESH & LAGGING
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 02,1984
Chainage :Start 1845.15 m
End 1860.90 m
Advance for day 15.75 m

File Name: DY08-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	1.05	MINING		1.25	9-24	15000	COMPLETED PUSH
1.05	1.20	RING INSTALLATION	1231				
1.20	1.50	MINING		-	-	-	INCOMPLETE PUSH
1.50	2.00	DELAY					EXPAND RING #1230
2.00	2.20	MINING		1.50	9-24	15000	COMPLETED PUSH
2.20	2.50	RING INSTALLATION	1232				
2.50	3.15	MINING		-	-	-	INCOMPLETE PUSH
3.15	3.20	DELAY					EXPAND RING #1231
3.20	3.40	MINING		1.50	9-24	15000	COMPLETED PUSH
3.40	3.50	RING INSTALLATION	1233				
3.50	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	5.10	MINING		-	-	-	INCOMPLETE PUSH
5.10	5.18	DELAY					EXPAND RING #1232
5.18	5.30	MINING		1.50	9-24	15000	COMPLETED PUSH
5.30	5.52	RING INSTALLATION	1234				
5.52	6.20	MINING		1.50	1-3,13-24	15000	-
6.20	6.25	DELAY					EXPAND RING #1233
6.25	6.40	MINING		-	-	-	INCOMPLETE PUSH
6.40	6.55	RING INSTALLATION	1235				
6.55	7.45	MINING		1.25	3-24	10000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGE CUTTERS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.52	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.52	15.07	MINING		0.25	3,4,13-21, 16-24	14000	COMPLETED PUSH
15.07	15.20	RING INSTALLATION	1236				
15.20	15.32	MINING		0.28	3,4,13-23, 16-24	13500	INCOMPLETE PUSH
15.32	15.45	DELAY					T.B.M. HEAD KNOCKING (CHECK)
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.30	DELAY		-	-	-	INSTALL PILOT FILTER
16.30	16.55	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 02,1984
Chainage :Start 1845.15 m
End 1860.90 m
Advance for day 15.75 m

File Name: DY08-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.55	19.05	DELAY		-	-	-	REPLACE BROKEN HYDRLC. HOSE(RETURN HOSE TO NO.7 MAIN DRIVE MOTOR)
19.05	19.20	MINING		1.22	3,4,12-24	14000	COMPLETED PUSH
19.20	19.30	RING INSTALLATION	1237				
19.30	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.00	MINING		1.50	3,4,14,16-24	14000	COMPLETED PUSH
21.00	21.10	RING INSTALLATION	1238				
21.10	22.05	MINING		1.50	3,4,12,16-24	14000	-
22.05	22.15	RING INSTALLATION	1239				
22.15	23.10	MINING		1.50	3,4,12,16-24	14000	-
23.10	23.20	RING INSTALLATION	1240				
23.20	23.45	MINING		1.00	3,4,12,16-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date AUGUST 03,1984
Chainage :Start 1860.90 m
End 1881.05 m
Advance for day 20.15 m

File Name: DY08-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.17	-- SHIFT CHANGE------					
0.17	0.40	MINING		0.50	3,4,9,10,13-24	12000	COMPLETED PUSH
0.40	0.55	RING INSTALLATION	1241				
0.55	1.50	MINING		1.50	3,4,9,10,13-24	12000	-
1.50	2.05	RING INSTALLATION	1242				
2.05	2.45	MINING		1.50	3,4,9,10,13-24	12000	-
2.45	3.00	RING INSTALLATION	1243				
3.00	3.40	MINING		-	-	-	INCOMPLETE PUSH
3.40	3.50	DELAY					POWER OFF AT T.B.M.
3.50	3.52	MINING		1.50	3,4,9,10,13-24	12000	COMPLETED PUSH
3.52	4.05	RING INSTALLATION	1244				
4.05	4.35	LUNCH					
4.35	5.07	MINING		-	-	-	INCOMPLETE PUSH
5.07	5.15	DELAY					EXPAND RING #1243
5.15	5.30	MINING		1.50	3,4,9,10,13-24	12000	COMPLETED PUSH
5.30	5.45	RING INSTALLATION	1245				
5.45	6.36	MINING		1.50	3,4,9,10,13-24	12000	-
6.36	6.51	RING INSTALLATION	1246				
6.51	7.42	MINING		1.20	3,4,9,10,13-24	12000	INCOMPLETE PUSH
7.42	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #16,40,42B,43A. EXTEND BELT
12.00	12.30	LUNCH					
12.30	13.15	MAINTENANCE		-	-	-	END CUTTER CHANGE ASSORTED MACHINE MAINTENANCE
13.15	13.30	MINING		0.30	3,4,13,21-23, 10-24	12500	COMPLETED PUSH
13.30	14.00	RING INSTALLATION	1247				
14.00	14.30	MINING		-	-	-	INCOMPLETE PUSH
14.30	14.50	DELAY					
14.50	15.24	MINING		1.50	3,4,13,21-23, 10-24	12500	COMPLETED PUSH
15.24	15.45	RING INSTALLATION	1248				
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.30	DELAY		-	-	-	CHECK WATERSPRAYS & ADJUST TENSION ON PRIMARY BELT.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 03,1984
Chainage :Start 1860.90 m
End 1881.05 m
Advance for day 20.15 m

File Name: DY08-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.30	17.27	MINING		1.50	3,4,12-24	13000	-
17.27	17.40	RING INSTALLATION	1249				
17.40	18.35	MINING		1.50	3,4,12,14, 16-24	13000	-
18.35	18.45	RING INSTALLATION	1250				
18.45	19.40	MINING		1.50	3,4,12,14, 16-24	12000	-
19.40	19.50	RING INSTALLATION	1251				
19.50	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.15	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
21.15	21.25	RING INSTALLATION	1252				
21.25	22.20	MINING		1.50	3,4,12-24	12000	-
22.20	22.30	RING INSTALLATION	1253				
22.30	23.25	MINING		1.50	3,4,12-24	12000	-
23.25	23.35	RING INSTALLATION	1254				
23.35	23.45	MINING		0.15	3,4,12-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 04,1984 File Name: DY08-04A
Chainage :Start 1881.05 m
End 1889.30 m Project No: 831-6014
Advance for day 8.25 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.25	DELAY					SET UP FOR MINING
0.25	0.50	MINING		-	-	-	INCOMPLETE PUSH
0.50	0.59	DELAY					INSTALL SPACERS ON RING #1253
0.59	1.07	MINING		-	-	-	INCOMPLETE PUSH
1.07	1.09	DELAY					SECONDARY BELT STOPPED
1.09	1.15	MINING		1.49	3,4,12,13,15, 17-24	14000	COMPLETED PUSH
1.15	1.29	RING INSTALLATION	1255				
1.29	2.05	MINING		-	-	-	INCOMPLETE PUSH
2.05	2.09	DELAY					INSTALL SPACERS ON RING #1254
2.09	2.23	MINING		1.49	3,4,12-24	11000	COMPLETED PUSH
2.23	2.34	RING INSTALLATION	1256				
2.34	2.56	MINING		-	-	-	INCOMPLETE PUSH
2.56	2.58	DELAY					SECONDARY BELT STOPPED
2.58	3.09	MINING		-	-	-	INCOMPLETE PUSH
3.09	3.14	DELAY					INSTALL SPACERS ON RING #1255
3.14	3.29	MINING		1.48	3,4,12-24	11000	COMPLETED PUSH
3.29	3.42	RING INSTALLATION	1257				
3.42	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.20	DELAY					INSTALL SPACERS ON RING #1256
4.20	4.50	LUNCH					
4.50	5.00	DELAY					WAIT FOR STARTUP OF NO.3 DRIVE MOTOR (SHUT OFF FOR INSTALLATION OF ROLLERS)
5.00	5.04	MINING		-	-	-	INCOMPLETE PUSH
5.04	5.10	DELAY					OPEN WATERSUPPLY LINE FULLY(SUPPLY LOW)
5.10	5.21	MINING		1.43	3-8,12,14, 16-24	11000	COMPLETED PUSH
5.21	5.31	RING INSTALLATION	1258				
5.31	6.04	MINING		-	-	-	INCOMPLETE PUSH
6.04	6.09	DELAY					INSTALL SPACERS ON RING #1257
6.09	6.24	MINING		1.50	3-8,17-24	13000	COMPLETED PUSH
6.24	6.36	RING INSTALLATION	1259				
6.36	7.00	MINING		-	-	-	INCOMPLETE PUSH
7.00	7.05	DELAY					INSTALL MESH
7.05	7.12	MINING		0.86	3-8,17-24	13000	INCOMPLETE PUSH
7.12	7.16	DELAY					INSTALL SPACERS ON RING #1258

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 04,1984
Chainage :Start 1881.05 m
End 1889.30 m
Advance for day 8.25 m

File Name: DY08-04A
Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
7.16	7.40	DELAY					SPRAY POLYDRILL OVER THE FORWARD SECTION OF THE T.B.M.
7.40	8.00	-- SHIFT CHANGE------		-	-	-	END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 06,1984
Chainage :Start 1889.10 m
End 1895.14 m
Advance for day 6.04 m

File Name: DY08-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,14,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.55	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.55	14.45	DELAY					NO.2 BELT DRIVE WOULDN'T START (ELECTRICAL PROBLEMS)
14.45	15.00	DELAY					MOTOR AREA(WEST) ON T.B.M. SMOKING
15.00	15.22	MINING		0.64	3-8,17-24	14000	COMPLETED PUSH
15.22	15.35	RING INSTALLATION	1260				
15.35	15.45	MINING		0.10	3-8,17-24	14000	INCOMPLETE PUSH
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.48	MINING		-	-	-	INCOMPLETE PUSH
16.48	16.55	DELAY					EXPAND RING #1259 & INSTALL SPACER
16.55	17.14	MINING		1.40	3-8,17-24	10000	COMPLETED PUSH
17.14	17.29	RING INSTALLATION	1261				
17.29	18.04	MINING		-	-	-	INCOMPLETE PUSH
18.04	18.12	DELAY					EXPAND RING #1260 & INSTALL SPACER
18.12	18.24	MINING		1.50	3,4,6,8,14,16,17-24	13000	COMPLETED PUSH
18.24	18.38	RING INSTALLATION	1262				
18.38	19.20	MINING		-	-	-	INCOMPLETE PUSH
19.20	20.25	DELAY & LUNCH					EXPAND RING #1261 & INSTALL SPACER T.B.M. KICKING OUT, CLEAN PILOT FILTERS
20.25	20.45	MINING		1.50	3,4,9-12,17-24	12500	COMPLETED PUSH
20.45	20.57	RING INSTALLATION	1263				
20.57	21.08	MINING		-	-	-	INCOMPLETE PUSH
21.08	23.12	DELAY					REPLACE BROKEN HYDRLC. HOSE(MAIN HOSE, BOOST PUMP TO NO.8 CUTTERHEAD PUMP)
23.12	23.40	MINING		0.90	3-8,17-24	11000	COMPLETED PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 07,1984
Chainage :Start 1895.14 m
End 1912.20 m
Advance for day 17.06 m

File Name: DY08-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.55	MINING		0.56	3-9,12-24	11000	COMPLETED PUSH
0.55	1.10	RING INSTALLATION	1264				
1.10	1.30	MINING		-	-	-	INCOMPLETE PUSH
1.30	2.10	DELAY					CLEANED PILOT FILTER(LOW PRESSURE)
2.10	2.53	MINING		1.50	5-8,13-24	11000	COMPLETED PUSH
2.53	3.05	RING INSTALLATION	1265				
3.05	3.20	MINING		-	-	-	INCOMPLETE PUSH
3.20	3.55	DELAY					INSTALL NEW PILOT FILTER
3.55	4.47	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
4.47	4.55	DELAY					EXPAND RING #1264
4.55	5.05	RING INSTALLATION	1266				
5.05	5.45	MINING		-	-	-	-
5.45	6.05	DELAY					ALTERNATING PILOT FILTERS
6.05	6.25	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
6.25	6.35	RING INSTALLATION	1267				
6.35	7.45	MINING		1.50	3,4,12-24	11000	-
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #42A,43B. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.30	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.30	13.50	RING INSTALLATION	1268				
13.50	14.50	MINING		1.50	1,3,13-24	14000	-
14.50	15.05	RING INSTALLATION	1269				
15.05	15.45	MINING		0.80	1,3,13-24	14000	INCOMPLETE PUSH
15.45	16.19	-- SHIFT CHANGE------					
16.19	16.33	MINING		-	-	-	INCOMPLETE PUSH
16.33	16.37	DELAY					EXPAND RING #1268 & INSTALL SPACER
16.37	16.53	MINING		0.70	3-8,17-24	12500	COMPLETED PUSH
16.53	17.11	RING INSTALLATION	1270				
17.11	17.51	MINING		-	-	-	INCOMPLETE PUSH
17.51	17.56	DELAY					EXPAND RING #1269 & INSTALL SPACER
17.56	18.08	MINING		1.50	3-12,17-24	12500	COMPLETED PUSH
18.08	18.22	RING INSTALLATION	1271				
18.22	19.04	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date AUGUST 07,1984
Chainage :Start 1895.14 m
End 1912.20 m
Advance for day 17.06 m

File Name: DY08-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.04	19.11	DELAY					EXPAND RING #1270 & INSTALL SPACER
19.11	19.24	MINING		1.50	3-8,10,12,14, 16,17-24	12500	COMPLETED PUSH
19.24	19.40	RING INSTALLATION	1272				
19.40	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.40	LUNCH					
20.40	20.51	MINING		-	-	-	INCOMPLETE PUSH
20.51	20.55	DELAY					EXPAND RING #1271 & INSTALL SPACER
20.55	21.13	MINING		1.50	3,4,10,12, 13-24	13000	COMPLETED PUSH
21.13	21.31	RING INSTALLATION	1273				
21.31	22.10	MINING		-	-	-	INCOMPLETE PUSH
22.10	22.16	DELAY					EXPAND RING #1272 & INSTALL SPACER
22.16	22.27	MINING		1.50	3,4,10,12, 17-24	12000	COMPLETED PUSH
22.27	22.38	RING INSTALLATION	1274				
22.38	23.22	MINING		-	-	-	INCOMPLETE PUSH
23.22	23.28	DELAY					
23.28	23.40	MINING		1.50	3,4,10,12, 17-24	13000	COMPLETED PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 08,1984
Chainage :Start 1912.20 m
End 1925.70 m
Advance for day 13.50 m

File Name: DY08-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.35	RING INSTALLATION	1275				
0.35	1.35	MINING		1.50	3-8,12,14, 17-24	12000	-
1.35	1.50	RING INSTALLATION	1276				
1.50	2.50	MINING		1.50	3,4,12-24	11000	-
2.50	3.05	RING INSTALLATION	1277				
3.05	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.40	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
4.40	4.55	RING INSTALLATION	1278				
4.55	6.10	MINING		1.50	3,4,12-24	10000	-
6.10	6.25	RING INSTALLATION	1279				
6.25	7.30	MINING		1.50	3,4,12-24	11000	-
7.30	7.45	RING INSTALLATION	1280				
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #30,32,42B,43A. DRILL & INSTALL 5 SETS OF 3.5m BOLT STRAPS BETWEEN RING #1205 & 1210
12.00	12.30	LUNCH					
12.30	14.35	MAINTENANCE		-	-	-	END CUTTER CHANGE ASSORTED MACHINE MAINTENANCE
14.35	15.15	DELAY		-	-	-	SCNDRY CONVEYOR WONT START(ELECTRICAL CABLE PINCHED)
15.15	15.45	MINING		0.60	3,4,13-24	14000	INCOMPLETE PUSH
15.45	16.24	-- SHIFT CHANGE------					
16.24	16.37	MINING		-	-	-	INCOMPLETE PUSH
16.37	16.42	DELAY					EXPAND RING #1279 & INSTALL SPACER
16.42	17.38	DELAY		-	-	-	SECONDARY CONVEYOR KICKED OFF(RE-REPAIR ELECTRICAL CABLE) SWITCH GEAR PROBLEMS(NO.7&8 MOTORS OFF)
17.38	18.03	MINING		0.90	3-8,11,17-24	12500	COMPLETED PUSH(6 MOTORS ONLY)
18.03	18.17	RING INSTALLATION	1281				
18.17	18.50	MINING		-	-	-	INCOMPLETE PUSH
18.50	18.56	DELAY					INSTALL MESH
18.56	18.59	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 08,1984
Chainage :Start 1912.20 m
End 1925.70 m
Advance for day 13.50 m

File Name: DY08-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.59	19.05	DELAY					NO.4 SWASH TROUBLE
19.05	19.25	MINING		-	-	-	INCOMPLETE PUSH
19.25	19.30	DELAY					EXPAND RING #1280 & INSTALL SPACER
19.30	19.35	DELAY					ATTEMPT WITH NO.7 & 8 MOTORS
19.35	20.04	MINING		1.50	3-12,17-24	13500	COMPLETED PUSH
20.04	20.20	RING INSTALLATION	1282				
20.20	20.50	LUNCH & DELAY					WORK ON NO.7 & 8 MOTORS
20.50	21.36	MINING		-	-	-	INCOMPLETE PUSH
21.36	21.40	DELAY					EXPAND RING #1281 & INSTALL SPACER
21.40	22.12	MINING		1.50	3-12,17-24	13500	COMPLETED PUSH(6 MOTORS ONLY)
22.12	22.26	RING INSTALLATION	1283				
22.26	22.57	MINING		-	-	-	INCOMPLETE PUSH
22.57	23.02	DELAY					EXPAND RING #1282 & INSTALL SPACER
23.02	23.40	MINING		1.50	3-12,17-24	13500	COMPLETED PUSH(6 MOTORS ONLY)
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel @ 2)

Date: AUGUST 09,1984
Chainage :Start 1925.70 m
End 1939.50 m
Advance for day 13.80 m

File Name: DY08-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	— SHIFT CHANGE------					
0.20	0.30	RING INSTALLATION	1284				
0.30	0.45	DELAY		-	-	-	POWER TROUBLE (NO.7 & 8 DRIVE MOTORS)
0.45	2.15	MINING		1.50	3-8,11-24	13000	-
2.15	2.30	RING INSTALLATION	1285				
2.30	3.40	MINING		1.50	3,4,11-24	13000	-
3.40	3.50	RING INSTALLATION	1286				
3.50	4.05	MINING		-	-	-	INCOMPLETE PUSH
4.05	4.35	LUNCH					
4.35	5.20	MINING		1.50	3-8,11-24	12000	COMPLETED PUSH
5.20	5.35	RING INSTALLATION	1287				
5.35	6.45	MINING		1.50	3-8,11-24	11000	-
6.45	7.00	RING INSTALLATION	1288				
7.00	7.45	MINING		0.90	3-8,11-24	10000	INCOMPLETE PUSH
7.45	8.15	— SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS @33,35,42A,43B. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.45	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.45	15.05	DELAY					NO GREASE IN CUTTINGHEAD, PUT 1 BARREL IN BY HAND
15.05	15.45	MINING		0.60	3,4,13-24	14000	INCOMPLETE PUSH
15.45	16.19	— SHIFT CHANGE------					
16.19	16.27	RING INSTALLATION	1289				
16.27	17.26	MINING		-	-	-	INCOMPLETE PUSH
17.26	17.30	DELAY					EXPAND RING @1288 & INSTALL SPACER
17.30	17.51	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
17.51	18.08	RING INSTALLATION	1290				
18.08	18.33	MINING		-	-	-	INCOMPLETE PUSH
18.33	18.37	DELAY					INSTALL MESH
18.37	19.10	MINING		-	-	-	INCOMPLETE PUSH
19.10	19.13	DELAY					EXPAND RING @1289 & INSTALL SPACER
19.13	19.31	MINING		1.50	11-24	15000	COMPLETED PUSH
19.31	19.45	RING INSTALLATION	1291				
19.45	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					

Notes: NO.7 & 8 MAIN DRIVE MOTORS DOWN, (TRANSFORMER OUT)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 09,1984
Chainage :Start 1925.70 m
End 1939.50 m
Advance for day 13.80 m

File Name: DY08-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.30	21.20	MINING		-	-	-	INCOMPLETE PUSH
21.20	21.24	DELAY					EXPAND RING #1290 & INSTALL SPACER
21.24	21.38	MINING		1.50	3,4,14,16, 17-24	15000	COMPLETED PUSH
21.38	21.55	RING INSTALLATION	1292				
21.55	22.49	MINING		-	-	-	INCOMPLETE PUSH
22.49	22.53	DELAY					EXPAND RING #1291 & INSTALL SPACER
22.53	23.06	MINING		1.50	3,4,10,12,14, 16,17-24	15000	COMPLETED PUSH
23.06	23.21	RING INSTALLATION	1293				
23.21	23.40	MINING		0.30	3-12,17-24	13500	INCOMPLETE PUSH
		-- SHIFT CHANGE----					

Notes: NO.7 & 8 MAIN DRIVE MOTORS DOWN (TRANSFORMER DOWN)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 10,1985
Chainage :Start 1939.50 m
End 1955.90 m
Advance for day 16.40 m

File Name: DY08-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE--					
0.20	1.15	MINING		1.20	3,4,12-24	13000	COMPLETED PUSH
1.15	1.27	RING INSTALLATION	1294				
1.27	2.32	MINING		1.50	3,4,11-24	13000	-
2.32	2.45	RING INSTALLATION	1295				
2.45	3.50	MINING		1.50	3,4,12-24	13000	-
3.50	4.05	RING INSTALLATION	1296				
4.05	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.37	MINING		1.50	3-8,12-24	13000	COMPLETED PUSH
5.37	5.50	RING INSTALLATION	1297				
5.50	6.57	MINING		1.50	3,4,12-24	13000	-
6.57	7.10	RING INSTALLATION	1298				
7.10	7.45	MINING		0.80	3,4,12-24	13000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE--					
8.15	12.00	MAINTENANCE		-	-	-	CHANGE 2 CUTTERS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.43	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.43	14.20	MINING		0.70	1-4,13-24	2000	COMPLETED PUSH
14.20	14.37	RING INSTALLATION	1299				
14.37	15.45	MINING		1.50	1-8,17-24	1900	-
15.45	16.18	-- SHIFT CHANGE--					
16.18	16.33	RING INSTALLATION	1300				
16.33	16.37	MINING		-	-	-	INCOMPLETE PUSH
16.37	16.52	DELAY					PRIMARY CONVEYOR STOPPED(MUCK IN HEAD)
16.52	17.33	MINING		-	-	-	INCOMPLETE PUSH
17.33	17.37	DELAY					EXPAND RING #1299 & INSTALL SPACERS
17.37	18.06	MINING		1.50	3-12,17-24	11000	COMPLETED PUSH
18.06	18.20	RING INSTALLATION	1301				
18.20	19.10	MINING		-	-	-	INCOMPLETE PUSH
19.10	19.14	DELAY					EXPAND RING #1300 & INSTALL SPACERS
19.14	19.42	MINING		1.50	3-8,17-24	13000	COMPLETED PUSH
19.42	20.00	RING INSTALLATION	1302				
20.00	20.20	MINING		-	-	-	INCOMPLETE PUSH
20.20	20.50	LUNCH					

Notes: NO.7 & 8 MAIN DRIVE MOTORS DOWN (TRANSFORMER OUT)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 10,1985 File Name: DY08-10A
Chainage :Start 1939.50 m
End 1955.90 m Project No: 831-6014
Advance for day 16.40 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.50	21.24	MINING		1.50	1-4,9-24	13000	-
21.24	21.28	DELAY					EXPAND RING #1301 & INSTALL SPACERS
21.28	21.48	MINING		-	-	-	INCOMPLETE PUSH
21.48	22.03	RING INSTALLATION	1303				
22.03	22.42	MINING		-	-	-	INCOMPLETE PUSH
22.42	22.46	DELAY					EXPAND RING #1302 & INSTALL SPACERS
22.46	23.13	MINING		1.50	1-4,9-24	14000	COMPLETED PUSH
23.16	23.26	RING INSTALLATION	1304				
23.26	23.40	MINING		0.20	1-4,9-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes: NO.7 & 8 MAIN DRIVE MOTORS DOWN (TRANSFORMER OUT)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 11,1984
Chainage :Start 1955.90 m
End 1960.97 m (REVISED)
Advance for day 5.07 m

File Name: DY08-11A
Project No: 631-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.10	DELAY					CHECK BRAKES ON RAKE CARS
0.10	0.30	-- SHIFT CHANGE------					
0.30	1.20	MINING		-	-	-	INCOMPLETE PUSH
1.20	1.55	DELAY					WAIT FOR BARREL OF ADJACENT (SURFACE)
1.55	2.10	MINING		1.30	3-8,11-24	11000	COMPLETED PUSH
2.10	2.25	RING INSTALLATION	1305				
2.25	3.45	MINING		1.50	3-8,13-24	12000	-
3.45	4.00	RING INSTALLATION	1306				
4.00	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.40	MINING		1.50	3-8,11-24	12000	COMPLETED PUSH
5.40	5.55	RING INSTALLATION	1307				
5.55	6.05	MINING		-	-	-	INCOMPLETE PUSH
6.05	6.15	DELAY					EXTEND WATER LINE
6.15	7.30	MINING		0.90	3-8,13-24	12000	INCOMPLETE PUSH
7.30	7.45	DELAY					CHECK OIL LEAKS
		-- SHIFT CHANGE------					END OF DAY'S WORK , WEEKEND

Notes: NO.7 & 8 MAIN DRIVE MOTORS DOWN (TRANSFORMER OUT)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 13,1984
Chainage :Start 1960.57 m
End 1967.57 m
Advance for day 7.00 m

File Name: DY08-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,42A,43B,?.
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE		-	-	-	INSTALL 1 SPLICE (NO.2 CONVEYOR)
							DRILLED & INSTALLED 3 SETS OF 3.5m KICKBOLTS @ RING #1212
14.00	14.25	MINING		0.60	3-8,12-24	10000	COMPLETED PUSH
14.25	14.40	RING INSTALLATION	1308				
14.40	15.00	MINING		-	-	-	INCOMPLETE PUSH
15.00	15.10	DELAY					EXPAND RING #1307
15.10	15.45	MINING		1.00	3-8,12-24	13000	INCOMPLETE PUSH
15.45	16.18	-- SHIFT CHANGE------					
16.18	16.48	MINING		0.50	13-24	14000	COMPLETED PUSH
16.48	17.00	RING INSTALLATION	1309				
17.00	17.19	MINING		-	-	-	INCOMPLETE PUSH
17.19	17.27	DELAY					INSTALL MESH
17.27	17.40	MINING		-	-	-	INCOMPLETE PUSH
17.40	18.10	DELAY					CLEAN PILOT FILTER
18.10	18.30	DELAY					TROUBLE STARTING SCRUBBER
18.30	19.00	MINING		-	-	-	INCOMPLETE PUSH
19.00	19.20	DELAY					CHANGE PILOT PUMP FILTER (SMALLER ONE)
19.20	19.25	MINING		1.50	13-24	14000	COMPLETED PUSH
19.25	19.40	RING INSTALLATION	1310				
19.40	20.52	MINING		1.50	13-24	14000	-
20.52	21.00	DELAY					CHANGE ADAUCENT OIL BARREL (LOW LEVEL)
21.00	21.15	RING INSTALLATION	1311				
21.15	21.45	DELAY					INSTALL 90DEGREE GLAND(NO.7 & 8 MOTORS)
21.45	22.05	MINING		-	-	-	INCOMPLETE PUSH
22.05	22.18	DELAY					T.B.M. CUTTING OUT(NO.7 & 8 MOTORS OFF)
22.18	23.00	MINING		1.50	13-24	14000	COMPLETED PUSH
23.00	23.15	DELAY					LOW OIL @ BOOSTPUMP(T.B.M. CUTTING OUT)
23.15	23.30	RING INSTALLATION	1312				
23.30	23.42	DELAY					WAIT FOR OIL FOR T.B.M.
		-- SHIFT CHANGE------					

Notes: NO.7 & 8 MAIN DRIVE MOTORS DOWN (TRANSFORMER OUT)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel @ 2)

Date AUGUST 14,1984
Chainage :Start 1967.57 m
End 1982.57 m
Advance for day 15.00 m

File Name: DY08-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.23	-- SHIFT CHANGE------					
0.23	0.42	MINING		-	-	-	INCOMPLETE PUSH
0.42	0.59	DELAY					LEAK IN HYDRLC. HOSE TO NO.24 RAM CYL.
0.59	1.52	MINING		1.50	3,4.5,13-24	11000	COMPLETED PUSH
1.52	2.13	RING INSTALLATION	1313				
2.13	2.23	MINING		-	-	-	INCOMPLETE PUSH
2.23	2.35	DELAY					PILOT FILTER CLOGGED
2.35	3.37	MINING		1.50	3,4.5,13-24	12000	COMPLETED PUSH
3.37	3.50	RING INSTALLATION	1314				
3.50	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.44	MINING		1.50	3-8,13,15, 17-24	12500	COMPLETED PUSH
5.44	5.59	RING INSTALLATION	1315				
5.59	6.48	MINING		-	-	-	INCOMPLETE PUSH
6.48	7.19	DELAY					POWER OUTAGE IN TRANSFORMER
7.19	7.32	MINING		1.50	3-8,13,15, 17-24	12000	COMPLETED PUSH
7.32	7.45	RING INSTALLATION	1316				
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS @11,40,42D,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.18	MAINTENANCE		-	-	-	END CUTTER CHANGE INSTALLED 1 NEW PILOT FILTER
14.18	14.25	MINING		-	-	-	INCOMPLETE PUSH
14.25	14.45	DELAY					MAIN CONVEYOR OFF
14.45	15.25	MINING		-	-	-	INCOMPLETE PUSH
15.25	15.32	DELAY					EXPAND RING @1315
15.32	15.36	MINING		1.25	3-8,12-24	11000	INCOMPLETE PUSH
15.36	15.45	DELAY					MAIN CONVEYOR OFF(STONE PILEUP @ NO.3 CONVEYOR TAIL ROLLER)
15.45	16.15	-- SHIFT CHANGE------					
16.15	16.30	MINING		0.25	5-8,13-24	11000	COMPLETED PUSH
16.30	16.45	RING INSTALLATION	1317				SPECIAL SET
16.45	16.50	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 14,1984 File Name: DY08-14A
Chainage :Start 1967.57 m
End 1982.57 m Project No: 831-6014
Advance for day 15.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.50	17.18	DELAY					REMOVE SPECIAL SET @ RING #1317 & INSTALL REGULAR SET OF THRUST BEAMS
17.18	18.10	MINING		1.50	5-8,13-24	11000	COMPLETED PUSH
18.10	18.25	RING INSTALLATION	1318				
18.25	19.15	MINING		1.50	5-8,13-24	11000	-
19.15	19.30	RING INSTALLATION	1319				
19.30	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.25	LUNCH					
20.25	20.50	MINING		1.50	5-8,13-24	11000	COMPLETED PUSH
20.50	21.05	RING INSTALLATION	1320				
21.05	21.35	MINING		-	-	-	INCOMPLETE PUSH
21.35	22.00	DELAY					BROKEN WATER LINE
22.00	22.20	MINING		1.50	5-8,13-24	11000	COMPLETED PUSH
22.20	22.30	RING INSTALLATION	1321				
22.30	22.45	DELAY					BROKEN WATER LINE
22.45	23.40	MINING		1.50	5-8,13-24	11000	-
23.40	23.45	RING INSTALLATION	1322				PARTIAL INSTALLATION
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 15,1984
Chainage :Start 1982.57 m
End 1998.27 m
Advance for day 15.70 m

File Name: DY08-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.32	RING INSTALLATION	1322				COMPLETE INSTALLATION
0.32	1.26	MINING		1.50	3,4,13-24	13500	-
1.26	1.40	RING INSTALLATION	1323				
1.40	2.35	MINING		1.50	3,4,13-24	13000	-
2.35	2.48	RING INSTALLATION	1324				
2.48	3.50	MINING		1.50	3-8,17-24	13000	-
3.50	4.20	LUNCH					
4.20	4.35	RING INSTALLATION	1325				
4.35	5.35	MINING		1.50	3-8,17-24	13500	-
5.35	5.49	RING INSTALLATION	1326				
5.49	6.43	MINING		1.50	3-8,17-24	13500	-
6.43	6.56	RING INSTALLATION	1327				
6.56	7.40	MINING		1.00	3-8,17-24	11000	-
7.40	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,37,42A,43B. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.45	MAINTENANCE		-	-	-	END CUTTER CHANGE CHANGE 6 & ADJUST 16 SCRAPER PADS
15.45	16.16	-- SHIFT CHANGE------					
16.16	16.55	RING INSTALLATION	1328				BUILD WITH SPECIAL SET OF THRUST BEAMS
16.55	17.06	RING INSTALLATION	1328				INSTALL SPECIAL SET OF THRUST BEAMS
17.06	18.06	MINING		1.50	3,4,13-24	12000	-
18.06	18.18	RING INSTALLATION	1329				
18.18	18.55	MINING		-	-	-	INCOMPLETE PUSH
18.55	19.10	DELAY					EXPAND RING #1329 & INSTALL MESH
19.10	19.30	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
19.30	19.45	RING INSTALLATION	1330				
19.45	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.10	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
21.10	21.25	RING INSTALLATION	1331				
21.25	22.15	MINING		1.50	3,4,13-24	12000	-
22.15	22.25	RING INSTALLATION	1332				
22.25	23.05	MINING		1.20	3,4,13-24	12000	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 15,1984
Chainage :Start 1982.57 m
End 1998.27 m
Advance for day 15.70 m

File Name: DY08-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.05	23.45	DELAY					RING #1329 & 1330 ROTATED, DRILL HOLES TO PIN RING
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 16,1984 File Name: DY08-16A
Chainage :Start 1998.27 m
End 2003.17 m Project No: 831-6014
Advance for day 4.90 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	3.04	DELAY		-	-	-	PINNED RING#1329,30 WITH 7 SETS OF PINS; REALIGN THRUST BEAMS
3.04	3.36	MINING		0.30	3,4.5,9-20	10000	COMPLETED PUSH
3.36	3.54	RING INSTALLATION	1333				
3.54	4.03	MINING		-	-	-	INCOMPLETE PUSH (RINGS STARTED TO MOVE)
4.03	4.33	LUNCH					
4.33	5.57	DELAY					PINNED RING#1329,30 WITH 11SETS OF PINS
5.57	6.44	MINING		-	-	-	INCOMPLETE PUSH
6.44	7.03	DELAY					INSTALL MESH & SPACERS
7.03	7.40	MINING		0.90	3,4,13-24	7000	INCOMPLETE PUSH
7.40	8.15	-- SHIFT CHANGE------					
8.15	9.50	MAINTENANCE		-	-	-	CHANGED CUTTERS #42A. PINNED RING #1333 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
9.50	10.43	MINING		0.60	3,4,12-24	10000	COMPLETED PUSH
10.43	11.00	RING INSTALLATION	1334				
11.00	11.50	MINING		-	-	-	INCOMPLETE PUSH
11.50	12.00	DELAY					INSTALL MESH
12.00	12.30	LUNCH					
12.30	13.15	MINING		-	-	-	INCOMPLETE PUSH
13.15	13.25	DELAY					EXPAND RING #1333
13.25	13.55	MINING		1.50	3,4,11-24	8000	COMPLETED PUSH
13.55	14.10	RING INSTALLATION	1335				
14.10	14.45	MAINTENANCE		-	-	-	PINNED RING #1334 WITH 6 SETS OF PINS
14.45	15.45	MAINTENANCE		-	-	-	PINNED RING #1333 WITH 4 SETS OF PINS
15.45	16.15	-- SHIFT CHANGE------					
16.15	18.45	MAINTENANCE		-	-	-	PINNED RING #1330 WITH 6 SETS OF BOLTS PINNED RING #1334 WITH 2 SETS OF PINS
18.45	19.35	MINING		-	-	-	INCOMPLETE PUSH
19.35	20.00	DELAY					EXPAND RING #1334(Y-RING STIFF)
20.00	21.40	MINING		1.50	3,4,9-24	7500	COMPLETED PUSH
21.40	21.50	DELAY					DRILL FOR EXTRA RING PINS
21.50	21.55	DELAY					PUSH PUMP CUTTING OUT
21.55	22.10	RING INSTALLATION	1336				
22.10	22.50	DELAY					RETRACT EXPANSION RING

Notes:

Dontin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date AUGUST 16,1984
Chainage :Start 1998.27 m
End 2003.17 m
Advance for day 4.90 m

File Name: DY08-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		DELAY CONT'D					(CENTRE PISTON JAMMED WITH MUCK)
22.50	23.00	MINING		0.10	3,4,9-24	7500	INCOMPLETE PUSH
23.00	23.45	MAINTENANCE					PINNED RING #1331
							PINNED RING #1333
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 17,1984
Chainage :Start 2003.17 m
End 2003.87 m
Advance for day 0.70 m

File Name: DY08-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	3.26	DELAY		-	-	-	PINNED RING #1334 WITH:
							4-20"LONG x 1 5/8" DIA. PINS (ON TOP)
							4 STRAPS USING 22" PINS (ON TOP)
							2 STRAPS USING 60" ROCKBOLTS (WEST)
							4-3" DIA. DOWELS
							PINNED RING #1333 WITH:
							2 STRAPS USING 60" ROCKBOLTS
							SEVERAL GENERAL 24" PINS
3.26	4.03	MINING		0.20	13-24	5-6000	INCOMPLETE PUSH (PINS NOT HOLDING)
							ROCK IS IN POOR CONDITION
4.03	4.30	LUNCH					
4.30	7.45	DELAY		-	-	-	GENERAL CLEANUP
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	DELAY		-	-	-	REMOVE THRUST BEAMS (RING #1330-1331)
							RESET THRUST BEAMS: (RING #1328-1329)
							(RING #1329-1330)
							(RING #1331-1332)
12.00	12.30	LUNCH					
12.30	15.45	DELAY		-	-	-	CONTINUE RESET THRUST BEAMS
15.45	16.15	-- SHIFT CHANGE------					
16.15	20.00	DELAY		-	-	-	INSTALL SPECIAL SET OF THRUST BEAMS
							(RING #1330-1331)
							PIN RING #1330,31 AT BOTTOM
20.00	20.30	LUNCH					
20.30	22.45	DELAY		-	-	-	END THRUST BEAM INSTALLATION (TOTAL=24)
22.45	22.50	DELAY		-	-	-	START UP BELTS
22.50	23.20	MINING		-	-	-	INCOMPLETE PUSH
23.20	23.35	DELAY		-	-	-	EXPAND RING #1335
23.35	23.45	MINING		0.50	3,4,9-24	7.5-8000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 18,1984
Chainage :Start 2003.87 m
End 2007.72 m
Advance for day 3.85 m

File Name: DY08-18A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.43	DELAY					TROUBLE STARTING NO.3 MAIN DRIVE MOTOR
0.43	1.22	MINING		0.70	3,4,9-24	6500	COMPLETED PUSH
1.22	1.53	RING INSTALLATION	1337				
1.53	2.15	MINING		-	-	-	INCOMPLETE PUSH
2.15	2.23	DELAY					INSTALL 4 TEMP. STRUTS (9,11,13,15)
2.23	2.28	MINING		-	-	-	INCOMPLETE PUSH
2.28	2.35	DELAY					ADJUST EXPANSION @ RING #1336 (LOOSE)
2.35	3.07	MINING		-	-	-	INCOMPLETE PUSH
3.07	3.27	DELAY					INSTALL 4 PERM. STRUTS(RING #1336-1337)
3.27	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.00	MINING		1.50	3,4,9-24	7500	COMPLETED PUSH
5.00	5.22	RING INSTALLATION	1338				
5.22	6.08	MINING		-	-	-	INCOMPLETE PUSH
6.08	6.18	DELAY					INSTALL MESH
6.18	6.42	MINING		1.50	3-8,13,15, 17-24	11500	COMPLETED PUSH
6.42	7.13	RING INSTALLATION	1339				STRUTS TIGHT AT EAST SIDE
7.13	7.30	MINING		0.15	3-8,13,15, 17-24	10000	INCOMPLETE PUSH
7.30	7.40	DELAY					RING #1338 ROTATED TO WEST(APPROX.4.5°)
7.40	8.00	-- SHIFT CHANGE------					END OF DAY'S WORK,WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel @ 2)

Date: AUGUST 20,1984 (REVISED) File Name: BY08-20A
Chainage: Start 2006.09 m Project No: 831-6014
End 2011.78 m
Advance for day 4.09 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,43A.
							REPLACED PRIMARY CONVEYOR BELT
							REMOVE THRUST BEAMS (RING #1338-1339) & REPLACE WITH SPECIAL SET
12.00	12.30	LUNCH					
12.30	14.30	DELAY		-	-	-	PINNED RING #1336 & 1338 WITH:
							25-20"LONG x 1"DIA.PINS
							"12 STRAPS
							ASSORTED MACHINE MAINTENANCE
14.30	14.47	DELAY					SET UP FOR MINING
14.47	14.58	MINING		-	-	-	INCOMPLETE PUSH
14.58	15.02	DELAY					TROUBLE WITH SWITCH GEAR
15.02	15.17	MINING		-	-	-	INCOMPLETE PUSH
15.17	15.22	DELAY					RE-ADJUST EXPANSION RING
15.22	15.40	MINING		0.45	3,4,9-24	7500	INCOMPLETE PUSH(LOW PRESSURE TO AVOID RING ROTATION)
15.40	16.20	-- SHIFT CHANGE------					
16.20	16.53	DELAY					POWER TROUBLE (SECONDARY BELT)
16.53	17.30	MINING		0.80	3,4,12-24	10000	COMPLETED PUSH
17.30	17.45	RING INSTALLATION	1340				
17.45	18.00	MINING		-	-	-	INCOMPLETE PUSH
18.00	18.30	DELAY					POWER TROUBLE (SECONDARY BELT)
18.30	19.30	DELAY					SKID STUCK ON ROCKBOLT(RING #1334 WEST)
19.30	20.05	MINING		-	-	-	INCOMPLETE PUSH
20.05	20.35	LUNCH					
20.35	21.00	MINING		1.50	3,4,12-24	10000	COMPLETED PUSH
21.00	21.15	RING INSTALLATION	1341				
21.15	21.50	DELAY					SKID STUCK
21.50	23.00	MINING		1.50	3,4,12-24	10000	-
23.00	23.15	RING INSTALLATION	1342				
23.15	23.45	MINING		0.60	3,4,12-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 21,1984 File Name: DY08-21A
Chainage :Start 2011.78 m
End 2026.48 m Project No: 831-6014
Advance for day 14.70 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.17	-- SHIFT CHANGE------					
0.17	0.40	MINING		-	-	-	INCOMPLETE PUSH
0.40	1.25	DELAY					SKID STUCK
1.25	1.43	MINING		0.90	3,4,13-24	12000	COMPLETED PUSH
1.43	2.02	RING INSTALLATION	1343				
2.02	2.48	MINING		-	-	-	INCOMPLETE PUSH
2.48	2.57	DELAY					EXPAND RING #1342
2.57	3.18	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
3.18	3.34	RING INSTALLATION	1344				
3.34	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.15	DELAY					EXPAND RING #1343
4.15	4.45	LUNCH					
4.45	5.15	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
5.15	5.32	RING INSTALLATION	1345				
5.32	6.05	MINING		-	-	-	INCOMPLETE PUSH
6.05	6.16	DELAY					EXPAND RING #1344
6.16	6.40	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
6.40	7.00	RING INSTALLATION	1346				
7.00	7.43	MINING		0.90	3,4,13-24	12000	INCOMPLETE PUSH
7.43	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #16,35,42A,43.
							PINNED RING #1346 WITH 4 SETS OF PINS
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #1344 & 1345 WITH:
							STRAPS (7 SETS) USING 24" ROCKBOLTS
12.00	12.30	LUNCH					
12.30	13.01	DELAY		-	-	-	SET UP FOR MINING(POWER OFF FOR 5 MIN.)
13.01	13.33	MINING		0.60	3,4,9-24	9500	COMPLETED PUSH
13.33	13.45	DELAY					EXPAND RING #1346 & INSTALL SPACERS
13.45	14.04	RING INSTALLATION	1347				
14.04	14.14	DELAY					SURFACE BELT KICKED OUT
14.14	14.34	MINING		-	-	-	INCOMPLETE PUSH
14.34	14.54	DELAY					INSTALL MESH & PULL BACK EXPANSION RING
14.54	15.41	MINING		1.30	3,4,9-24	9000	INCOMPLETE PUSH
15.41	16.20	-- SHIFT CHANGE------					
16.20	16.30	MINING		0.20	3,4,9-24	10000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 21,1984 File Name: DY08-21A
Chainage :Start 2011.78 m
End 2026.48 m Project No: 831-6014
Advance for day 14.70 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.30	16.45	RING INSTALLATION	1348				
16.45	17.45	MINING		1.50	3,4,10,12, 12-24	11000	-
17.45	17.55	RING INSTALLATION	1349				
17.55	19.00	MINING		1.50	3,4,12-24	11000	-
19.00	19.15	RING INSTALLATION	1350				
19.15	19.35	MINING		-	-	-	INCOMPLETE PUSH
19.35	19.45	DELAY					INSTALL MESH
19.45	20.05	MINING		-	-	-	INCOMPLETE PUSH
20.05	20.35	LUNCH					
20.35	21.00	MINING		1.50	3,4,9-24	11000	COMPLETED PUSH
21.00	21.12	RING INSTALLATION	1351				
21.12	22.20	MINING		1.50	3,4,12-24	12000	-
22.20	22.40	RING INSTALLATION	1352				
22.40	23.00	MINING		0.30	3,4,12-24	12000	INCOMPLETE PUSH
23.00	23.45	DELAY					START TO RESPLICE PRIMARY BELT (TORN)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 22,1984 — File Name: DY08-22A
Chainage :Start 2026.48 m
End 2038.78 m — Project No: 831-6014
Advance for day 12.30 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	2.20	DELAY					REPAIR PRIMARY CONVEYOR BELT
2.20	3.10	MINING		1.20	3,4,13-24	13000	COMPLETED PUSH
3.10	3.25	RING INSTALLATION	1353				
3.25	3.45	DELAY					LINE UP RING & PUSH RING
3.45	4.35	MINING		-	-	-	INCOMPLETE PUSH
4.35	4.45	DELAY					EXPAND RING #1352
4.45	5.15	LUNCH					
5.15	5.25	DELAY					EXTEND WATER LINE
5.25	5.45	MINING		1.50	3,4,13-24	11000	COMPLETED PUSH
5.45	6.00	RING INSTALLATION	1354				
6.00	6.35	MINING		-	-	-	INCOMPLETE PUSH
6.35	6.40	DELAY					EXPAND RING #1353
6.40	7.00	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
7.00	7.20	RING INSTALLATION	1355				
7.20	7.45	MINING		0.50	3,4,13-24	12000	INCOMPLETE PUSH
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #13,14,42B,43A. PINNED RING #1354 WITH 4 SETS OF STRAPS ASSORTED MACHINE MAINTENANCE INSTALL LAGGING (RING #1327-1331)
12.00	12.30	LUNCH					
12.30	13.18	DELAY		-	-	-	SET UP FOR MINING
13.18	13.56	MINING		1.00	3,4,9-24	9000	COMPLETED PUSH
13.56	14.14	DELAY					EXPAND RING #1354 & INSTALL SPACERS
14.14	14.22	RING INSTALLATION	1356				
14.22	15.16	MINING		1.50	3,4,9-24	10000	-
15.16	15.24	DELAY					EXPAND RING #1355 & INSTALL SPACERS
15.24	15.33	RING INSTALLATION	1357				
15.33	15.43	MINING		0.30	3,4,9-24	10000	INCOMPLETE PUSH
15.43	16.17	-- SHIFT CHANGE------					
16.17	16.55	MINING		-	-	-	INCOMPLETE PUSH
16.55	20.45	DELAY					REPLACE TORN BELT ON PRIMARY CONVEYOR (ELEVEN FEET)
20.45	20.52	MINING		1.20	3,4,12-24	12000	COMPLETED PUSH
20.52	21.02	RING INSTALLATION	1358				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 22,1984
Chainage :Start 2026.48 m
End 2038.78 m
Advance for day 12.30 m

File Name: DY08-22A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
21.02	21.53	MINING		1.50	3,4,12-24	12000	-
21.53	22.05	RING INSTALLATION	1359				
22.05	23.00	MINING		1.50	3,4,12-24	12000	-
23.00	23.15	RING INSTALLATION	1360				
23.15	23.45	MINING		0.60	3,4,11-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 23,1984
Chainage :Start 2038.78 m
End 2056.38 m
Advance for day 17.60 m

File Name: DY08-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.40	MINING		-	-	-	INCOMPLETE PUSH
0.40	0.45	DELAY					EXPAND RING #1359
0.45	0.50	MINING		0.90	3,4,9-24	13000	COMPLETED PUSH
0.50	1.05	RING INSTALLATION	1361				
1.05	1.40	MINING		-	-	-	INCOMPLETE PUSH
1.40	1.45	DELAY					EXPAND RING #1360
1.45	2.00	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
2.00	2.14	RING INSTALLATION	1362				
2.14	2.53	MINING		-	-	-	INCOMPLETE PUSH
2.53	3.00	DELAY					EXPAND RING #1361
3.00	3.13	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
3.13	3.25	RING INSTALLATION	1363				
3.25	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.05	DELAY					EXPAND RING #1362
4.05	4.35	LUNCH					
4.35	5.00	DELAY					BROKEN WATER LINE
5.00	5.20	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
5.20	5.35	RING INSTALLATION	1364				
5.35	6.08	MINING		-	-	-	INCOMPLETE PUSH
6.08	6.13	DELAY					EXPAND RING #1363
6.13	6.30	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
6.30	6.45	RING INSTALLATION	1365				
6.45	7.20	MINING		-	-	-	INCOMPLETE PUSH
7.20	7.25	DELAY					EXPAND RING #1364
7.25	7.45	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #12,15,42,43.
							PINNED RING #1364 & 1365 WITH:
							12 STRAPS USING 20° ROCKBOLTS
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE		-	-	-	RESPLICE PRIMARY BELT
14.00	14.15	RING INSTALLATION	1366				
15.40	16.15	-- SHIFT CHANGE------					
16.15	16.30	DELAY					ADJUST SCRAPER ON PRIMARY BELT

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 23,1984
Chainage :Start 2038.78 m
End 2056.38 m
Advance for day 17.60 m

File Name: DY08-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.30	17.25	MINING		1.50	3,4,9-24	12000	-
17.25	17.40	RING INSTALLATION	1367				
17.40	18.30	MINING		1.40	3,4,10,12-24	12000	-
18.30	18.45	RING INSTALLATION	1368				
18.45	19.35	MINING		1.50	3,4,10,12-24	13000	-
19.35	19.45	RING INSTALLATION	1369				
19.45	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.10	MINING		1.50	3,4,14,16-24	14000	COMPLETED PUSH
21.10	21.20	RING INSTALLATION	1370				
21.20	22.10	MINING		1.50	3,4,10,12-24	13000	-
22.10	22.25	RING INSTALLATION	1371				
22.25	23.15	MINING		1.50	3,4,12-24	13000	-
23.15	23.30	RING INSTALLATION	1372				
23.30	23.45	MINING		0.30	3,4,12-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 24,1984 File Name: DY08-24A
Chainage :Start 2056.38 m
End 2074.38 m Project No: 831-6014
Advance for day 18.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.17	-- SHIFT CHANGE------					
0.17	0.45	MINING		-	-	-	INCOMPLETE PUSH
0.45	0.50	DELAY					EXPAND RING #1371
0.50	1.05	MINING		1.20	3,4,13-24	13000	COMPLETED PUSH
1.05	1.20	RING INSTALLATION	1373				
1.20	1.50	MINING		-	-	-	INCOMPLETE PUSH
1.50	2.01	DELAY					EXPAND RING #1372
2.01	2.18	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
2.18	2.30	RING INSTALLATION	1374				
2.30	2.58	MINING		-	-	-	INCOMPLETE PUSH
2.58	3.12	DELAY					EXPAND RING #1373
3.12	3.38	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
3.38	3.50	RING INSTALLATION	1375				
3.50	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.30	DELAY					EXPAND RING #1374
4.30	5.00	LUNCH					
5.00	5.10	DELAY					HOOK UP WATER LINE
5.10	5.35	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
5.35	5.45	RING INSTALLATION	1376				
5.45	6.15	MINING		-	-	-	INCOMPLETE PUSH
6.15	6.20	DELAY					EXPAND RING #1375
6.20	6.36	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
6.36	6.48	RING INSTALLATION	1377				
6.48	7.12	MINING		-	-	-	INCOMPLETE PUSH
7.12	7.17	DELAY					EXPAND RING #1376
7.17	7.45	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #16,22,42,43A.
							PINNED RING #1376 & 1377 WITH:
							8 SETS USING 20° ROCKBOLTS & PLATES
							ASSORTED MACHINE MAINTENANCE
		RING INSTALLATION	1378				
12.00	12.30	LUNCH					
12.30	15.10	DELAY		-	-	-	REMOVE LENGTH OF BELT (TOO LONG)
15.10	15.29	DELAY					T.B.M. HARD TO START, NEW CARD REQ'D FOR CONTROL FROM OUT STATION

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 24,1984 File Name: DY08-24A
Chainage :Start 2056.38 m
End 2074.38 m Project No: 831-6014
Advance for day 18.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
15.29	15.43	MINING		0.30	3,4,13-24	13000	INCOMPLETE PUSH
15.43	16.20	-- SHIFT CHANGE------					
16.20	16.25	DELAY					INSTALL CARD-PUSH PUMP
16.25	17.10	MINING		1.20	3,4,13-24	12000	COMPLETED PUSH
17.10	17.20	RING INSTALLATION	1379				
17.20	17.40	DELAY					ADJUST FLARES ON NO.3 CONVEYOR CHUTE
17.40	18.35	MINING		1.50	3,4,9-24	12000	-
18.35	18.45	RING INSTALLATION	1380				
18.45	19.40	MINING		1.50	3,4,13-24	12000	-
19.40	19.50	RING INSTALLATION	1381				
19.50	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.40	LUNCH					
20.40	21.15	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
21.15	21.25	RING INSTALLATION	1382				
21.25	22.20	MINING		1.50	3,4,13-24	12000	-
22.20	22.30	RING INSTALLATION	1383				
22.30	23.20	MINING		1.50	3,4,13-24	12000	-
23.20	23.30	RING INSTALLATION	1384				
23.30	23.45	MINING		0.30	3,4,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 25,1984
Chainage :Start 2074.38 m
End 2083.88 m
Advance for day 9.50 m

File Name: DY00-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	1.00	MINING		1.20	3,4,9-24	13000	COMPLETED PUSH
1.00	1.15	RING INSTALLATION	1385				
1.15	2.00	MINING		1.50	3,4,9-24	13000	-
2.00	2.12	RING INSTALLATION	1386				
2.12	3.04	MINING		1.50	3,4,9-24	13000	-
3.04	3.16	RING INSTALLATION	1387				
3.16	4.05	MINING		1.50	3,4,13-24	13000	-
4.05	4.18	RING INSTALLATION	1388				
4.18	4.35	MINING		-	-	-	INCOMPLETE PUSH
4.35	5.05	LUNCH					
5.05	5.45	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
5.45	6.00	RING INSTALLATION	1389				
6.00	6.50	MINING		1.50	3,4,13-24	13000	-
6.50	7.05	RING INSTALLATION	1390				
7.05	7.30	MINING		0.80	3,4,13-24	13000	INCOMPLETE PUSH
7.30	7.45	DELAY					WORK ON WATER PUMP & CLEAN SKID
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: AUGUST 27,1984
Chainage: Start 2083.88 m
End 2095.43 m
Advance for day 11.55 m

File Name: DY08-27A
Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	— SHIFT CHANGE------					
8.15	9.00	DELAY					CLEAN MUCK FROM T.B.M. HEAD
9.00	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,19,42B,43A.
							PINNED RING #1388 WITH 4 SETS OF PINS
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.15	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.15	13.45	MINING		0.75	3,4,13-24	11000	COMPLETED PUSH
13.45	13.58	RING INSTALLATION	1391				
13.58	14.50	MINING		1.50	3,4,13-24	11000	-
14.50	15.02	RING INSTALLATION	1392				
15.02	15.10	DELAY					MAIN CONVEYOR DOWN
15.10	15.45	MINING		0.90	3,4,13-24	11000	INCOMPLETE PUSH
15.45	16.20	— SHIFT CHANGE------					
16.20	16.35	DELAY					EXTEND WATER LINE
16.35	17.00	MINING		0.60	3,4,13-24	12000	COMPLETED PUSH
17.00	17.10	RING INSTALLATION	1393				
17.10	18.10	MINING		1.50	3,4,10-24	12000	-
18.10	18.20	RING INSTALLATION	1394				
18.20	19.15	MINING		1.50	3,4,13-24	12000	-
19.15	19.25	RING INSTALLATION	1395				
19.25	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.40	LUNCH					
20.40	20.55	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
20.55	21.08	RING INSTALLATION	1396				
21.08	22.02	MINING		1.50	3,4,11-24	13000	-
22.02	22.15	RING INSTALLATION	1397				
22.15	23.00	MINING		-	-	-	INCOMPLETE PUSH
23.00	23.15	DELAY					TROUBLE WITH EXPANDING RING
23.15	23.25	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
23.25	23.35	RING INSTALLATION	1398				
23.35	23.45	MINING		0.30	3,4,13-24	13000	INCOMPLETE PUSH
		— SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 28,1984
Chainage :Start 2095.43 m
End 2115.43 m
Advance for day 20.00 m

File Name: DY08-2BA

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.57	MINING		1.20	3,4,13-24	13500	COMPLETED PUSH
0.57	1.19	RING INSTALLATION	1399				
1.19	2.05	MINING		1.50	3,4,13-24	13000	-
2.05	2.26	RING INSTALLATION	1400				ALSO EXPAND RING #1398
2.26	2.50	MINING		-	-	-	INCOMPLETE PUSH
2.50	3.01	DELAY					ADJUST EXPANSION RING LOCATION
3.01	3.27	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
3.27	3.46	RING INSTALLATION	1401				ALSO EXPAND RING #1399
3.46	4.03	MINING		-	-	-	INCOMPLETE PUSH
4.03	4.31	LUNCH					
4.31	4.55	MINING		-	-	-	INCOMPLETE PUSH
4.55	5.08	DELAY					EXPAND RING #1400
5.08	5.18	MINING		1.50	3,4,13-24	12500	COMPLETED PUSH
5.18	5.31	RING INSTALLATION	1402				
5.31	5.59	MINING		-	-	-	INCOMPLETE PUSH
5.59	6.08	DELAY					EXPAND RING #1401
6.08	6.26	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
6.26	6.38	RING INSTALLATION	1403				
6.38	7.07	MINING		-	-	-	INCOMPLETE PUSH
7.07	7.11	DELAY					EXPAND RING #1402
7.11	7.26	MINING		1.50	3,4,13-24	12500	COMPLETED PUSH
7.26	7.37	RING INSTALLATION	1404				
7.37	7.43	MINING		0.15	3,4,13-24	12500	INCOMPLETE PUSH
7.43	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #41,42A,43B.
							PINNED RING #1402 WITH 4 SETS OF PINS
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.00	14.25	MINING		-	-	-	INCOMPLETE PUSH
14.25	14.30	DELAY					SCNDRY BELT OFF(NO.3 SONCE ROLLER DOWN)
14.30	15.10	MINING		1.35	3,4,13-24	11000	COMPLETED PUSH
15.10	15.20	RING INSTALLATION	1405				
15.20	15.45	MINING		0.60	3,4,13-24	11000	INCOMPLETE PUSH
15.45	16.20	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 28,1984 File Name: DY08-28A
Chainage :Start 2095.43 m
End 2115.43 m Project No: 831-6014
Advance for day 20.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.20	16.50	MINING		0.90	3,4,13-24	12000	COMPLETED PUSH
16.50	17.00	RING INSTALLATION	1406				
17.00	18.00	MINING		1.50	3,4,13-24	12000	-
18.00	18.15	RING INSTALLATION	1407				
18.15	19.10	MINING		1.50	3,4,11-24	12000	-
19.10	19.22	RING INSTALLATION	1408				
19.22	20.15	MINING		1.50	3,4,10,12-24	12000	-
20.15	20.30	RING INSTALLATION	1409				
20.30	21.00	LUNCH					
21.00	21.53	MINING		1.50	3,4,10,12-24	12000	-
21.53	22.05	RING INSTALLATION	1410				
22.05	23.00	MINING		1.50	3,4,10,12-24	12000	-
23.00	23.12	RING INSTALLATION	1411				
23.12	23.45	MINING		0.80	3,4,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 29,1984
Chainage :Start 2115.43 m
End 2134.08 m
Advance for day 18.65 m

File Name: DY08-29A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.41	MINING		0.70	3,4,13-24	13000	COMPLETED PUSH
0.41	0.58	RING INSTALLATION	1412				
0.58	1.32	MINING		-	-	-	INCOMPLETE PUSH
1.32	1.38	DELAY					NO POWER AT T.B.M.
1.38	1.48	MINING		1.50	3,4,13-24	12500	-
1.48	2.03	RING INSTALLATION	1413				
2.03	2.28	DELAY					TROUBLE WITH NO.2 CONVEYOR
2.28	3.14	MINING		1.50	3,4,13-24	12500	-
3.14	3.30	RING INSTALLATION	1414				
3.30	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.51	MINING		1.50	3,4,13-24	12500	COMPLETED PUSH
4.51	5.04	RING INSTALLATION	1415				
5.04	5.53	MINING		1.50	3,4,13-24	12500	-
5.53	6.08	RING INSTALLATION	1416				
6.08	6.57	MINING		1.50	3,4,10,12, 13-24	12500	-
6.57	7.09	RING INSTALLATION	1417				
7.09	7.45	MINING		1.00	3,4,10,12, 13-24	12500	INCOMPLETE PUSH
7.45	8.16	-- SHIFT CHANGE------					
8.16	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #15,37,42B,43A. PINNED RING #1415 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.05	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.05	14.25	MINING		0.50	3,4,13-24	13000	COMPLETED PUSH
14.25	14.40	RING INSTALLATION	1418				
14.40	15.33	MINING		1.50	3,4,13-24	13000	-
15.33	15.45	RING INSTALLATION	1419				
15.45	16.20	-- SHIFT CHANGE------					
16.20	17.35	DELAY					REMOVE, RE-MEASURE & RE-INSTALL SPECIAL THRUST BEAMS (RING #1418-1419)
17.35	18.30	MINING		1.45	3,4,9-24	11000	-
18.30	18.42	RING INSTALLATION	1420				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: AUGUST 29,1984
Chainage: Start 2115.43 m
End 2134.08 m
Advance for day 18.65 m

File Name: DY08-29A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.42	19.00	MINING		-	-	-	INCOMPLETE PUSH
19.00	19.15	DELAY					MAIN CONVEYOR STOPPED
19.15	19.55	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
19.55	20.10	RING INSTALLATION	1421				
20.10	20.30	MINING		-	-	-	INCOMPLETE PUSH
20.30	21.00	LUNCH					
21.00	21.35	MINING		1.50	3,4,9-24	12000	-
21.35	21.47	RING INSTALLATION	1422				
21.47	22.37	MINING		1.50	3,4,13-24	12000	-
22.37	22.47	RING INSTALLATION	1423				
22.47	23.35	MINING		1.50	3,4,13-24	12000	-
23.35	23.45	RING INSTALLATION	1424				
		— SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 30,1984 File Name: DY08-30A
Chainage :Start 2134.08 m
End 2155.08 m Project No: 831-6014
Advance for day 21.00 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	1.05	MINING		1.50	3,4,9-24	12500	-
1.05	1.21	RING INSTALLATION	1425				
1.21	2.04	MINING		1.50	3,4,9-24	12500	-
2.04	2.17	RING INSTALLATION	1426				
2.17	3.03	MINING		1.50	3,4,13-24	13000	-
3.03	3.16	RING INSTALLATION	1427				
3.16	4.01	MINING		1.50	3,4,13-24	13000	-
4.01	4.31	LUNCH					
4.31	4.47	RING INSTALLATION	1428				
4.47	5.39	MINING		1.50	3,4,13-24	12000	-
5.39	5.52	RING INSTALLATION	1429				
5.52	5.55	MINING		-	-	-	INCOMPLETE PUSH
5.55	6.10	DELAY					PRIME WATER PUMP
6.10	6.54	MINING		1.50	3-8,13-24	12500	COMPLETED PUSH
6.54	7.06	RING INSTALLATION	1430				
7.06	7.45	MINING		1.20	3-8,13-16, 17-20.5,21-24	13000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #13,16,42A,43B. PINNED RING #1428 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.45	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.45	14.00	MINING		0.30	3-8,13-16, 21-24	13000	COMPLETED PUSH
14.00	14.13	RING INSTALLATION	1431				
14.13	15.10	MINING		1.50	3-8,13-16, 21-24	13000	-
15.10	15.21	RING INSTALLATION	1432				
15.21	15.44	MINING		0.50	3-8,13-16, 21-24	13000	INCOMPLETE PUSH
15.44	16.20	-- SHIFT CHANGE------					
16.20	16.50	MINING		1.00	3-8,17-24	12000	COMPLETED PUSH
16.50	17.05	RING INSTALLATION	1433				
17.05	18.00	MINING		1.50	3-8,13-24	12000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 30,1984
Chainage :Start 2134.08 m
End 2155.08 m
Advance for day 21.00 m

File Name: DY08-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.00	18.15	RING INSTALLATION	1434				
18.15	19.05	MINING		1.50	3,4,13-24	12000	-
19.05	19.18	RING INSTALLATION	1435				
19.18	20.15	MINING		1.50	3,4,13-24	12000	-
20.15	20.45	LUNCH					
20.45	21.00	RING INSTALLATION	1436				
21.00	21.50	MINING		1.50	3,4,13-24	12000	-
21.50	22.00	RING INSTALLATION	1437				
22.00	22.50	MINING		-	-	-	INCOMPLETE PUSH
22.50	23.30	DELAY					MAIN CONVEYOR OFF
23.30	23.35	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
23.35	23.45	RING INSTALLATION	1438				
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 31,1984
Chainage :Start 2155.08 m
End 2173.08 m
Advance for day 18.00 m

File Name: DY08-31A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.44	MINING		-	-	-	INCOMPLETE PUSH
0.44	0.59	DELAY					TROUBLE WITH BELT(NO.3 DRIVE STOPPED)
0.59	1.24	MINING		1.50	3,4,10,12, 13-24	12000	COMPLETED PUSH
1.24	1.37	RING INSTALLATION	1439				
1.37	3.35	DELAY					REPAIR HYDRLC. HOSE (NO.4 PUMP-RETURN MANIFOLD).NO.1 DRIVE ELECTRICAL TROUBLE
3.35	3.43	MINING		-	-	-	INCOMPLETE PUSH
3.43	3.50	DELAY					CONVEYOR BELTS STOPPED
3.50	4.34	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
4.34	4.47	RING INSTALLATION	1440				
4.47	5.33	MINING		1.50	3,4,13-24	12500	-
5.33	5.45	RING INSTALLATION	1441				
5.45	6.14	MINING		-	-	-	INCOMPLETE PUSH
6.14	6.24	DELAY					BELT STOPPED (CHUTE PLUGGED)
6.24	6.41	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
6.41	6.52	RING INSTALLATION	1442				
6.52	7.10	MINING		-	-	-	INCOMPLETE PUSH
7.10	7.18	DELAY					INSTALL MESH
7.18	7.45	MINING		1.30	3,4,9-16, 17-20.5,21-24	12000	INCOMPLETE PUSH
7.45	8.17	-- SHIFT CHANGE------					
8.17	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,11,42A,43B. PINNED RING #1441 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.07	MAINTENANCE		-	-	-	SPLICE PRIMARY CONVEYOR
15.07	15.18	MINING		0.20	3-8,13-24	10000	COMPLETED PUSH
15.18	15.30	RING INSTALLATION	1443				
15.30	15.43	MINING		0.30	3-8,13-24	11000	INCOMPLETE PUSH
15.43	16.20	-- SHIFT CHANGE------					
16.20	17.05	MINING		1.20	3-8,13-24	12000	COMPLETED PUSH
17.05	17.17	RING INSTALLATION	1444				
17.17	18.10	MINING		1.50	3,4,11-24	12000	-
18.10	18.20	RING INSTALLATION	1445				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date AUGUST 31,1984
Chainage :Start 2155.08 m
End 2173.08 m
Advance for day 18.00 m

File Name: DY08-31A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.20	19.10	MINING		1.50	3,4,13-24	12000	-
19.10	19.20	RING INSTALLATION	1446				
19.20	20.10	MINING		1.50	3,4,11-24	12000	-
20.10	20.20	RING INSTALLATION	1447				
20.20	20.35	MINING		-	-	-	INCOMPLETE PUSH
20.35	21.05	LUNCH					
21.05	21.47	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
21.47	21.52	RING INSTALLATION	1448				
21.52	22.45	MINING		1.50	3,4,11-24	12000	-
22.45	22.55	RING INSTALLATION	1449				
22.55	23.45	MINING		1.50	3,4,13-24	12000	-
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 01,1984
Chainage :Start 2173.08 m
End 2184.13 m
Advance for day 11.05 m

File Name: DY09-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.19	-- SHIFT CHANGE------					
0.19	0.36	RING INSTALLATION	1450				
0.36	1.20	MINING		1.50	3,4,9-24	12500	-
1.20	1.35	RING INSTALLATION	1451				
1.35	2.37	MINING		1.50	3,4,9-24	10500	USING 6 MOTORS ONLY
2.37	2.52	RING INSTALLATION	1452				
2.52	3.58	MINING		1.50	3,4,9-24	11500	USING 6 MOTORS ONLY
3.58	4.11	RING INSTALLATION	1453				
4.11	4.38	LUNCH					
4.38	5.28	MINING		1.50	3,4,5-8,13-24	10500	-
5.28	5.43	RING INSTALLATION	1454				
5.43	6.10	MINING		-	-	-	INCOMPLETE PUSH
6.10	6.23	DELAY					EXPAND RING #1453
6.23	6.40	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
6.40	6.53	RING INSTALLATION	1455				
6.53	7.38	MINING		1.50	3,4,13-24	12000	-
7.38	7.52	RING INSTALLATION	1456				
7.52	8.38	MINING		1.50	3,4,9-24	12500	-
8.38	8.56	RING INSTALLATION	1457				
8.56	9.13	MINING		0.55	3,4,13-24	13500	INCOMPLETE PUSH
9.13	9.30	-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 04,1984 File Name: DY09-04A
Chainage :Start 2184.13 m
End 2197.38 m Project No: 831-6014
Advance for day 13.25 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #13,18,42A,43B.
12.00	12.30	LUNCH					ASSORTED MACHINE MAINTENANCE
12.30	13.24	MAINTENANCE		-	-	-	EXTEND BELT
13.24	13.25	MINING		-	-	-	INCOMPLETE PUSH
13.25	13.28	DELAY					ALIGN MAIN BELT NO.3
13.28	13.59	MINING		0.95	3,4,11-24	10000	COMPLETED PUSH
13.59	14.13	RING INSTALLATION	1458				
14.13	14.37	MINING		-	-	-	INCOMPLETE PUSH
14.37	14.40	DELAY					INSTALL MESH
14.40	14.42	MINING		-	-	-	INCOMPLETE PUSH
14.42	14.48	DELAY					LOST POWER, INSTALLED LEGGING, CUTTER OVERLOADED
14.48	15.12	MINING		1.50	1-24	10000	COMPLETED PUSH
15.12	15.40	MINING & RING INST'N	1459	0.30	1-24	10000	INCOMPLETE PUSH/RING INST'D 15.12-15.28
15.40	16.20	-- SHIFT CHANGE------					
16.20	16.54	MINING		1.20	3,4,9-24	11000	COMPLETED PUSH
16.54	17.05	RING INSTALLATION	1460				
17.05	17.52	MINING		1.50	3,4,9-24	12000	-
17.52	18.06	RING INSTALLATION	1461				
18.06	18.52	MINING		1.50	3,4,9-24	13000	-
18.52	19.03	RING INSTALLATION	1462				
19.03	19.48	MINING		1.50	3,4,10,12-24	13000	-
19.48	20.00	RING INSTALLATION	1463				
20.00	20.30	LUNCH					
20.30	21.15	MINING		1.50	3,4,10,12-24	13000	-
21.15	21.27	RING INSTALLATION	1464				
21.27	22.14	MINING		1.50	3,4,10,12-24	13000	-
22.14	22.37	RING INSTALLATION	1465				
22.37	23.22	MINING		1.50	3,4,10,12-24	13000	-
23.22	23.31	RING INSTALLATION	1466				
23.31	23.42	MINING		0.30	3,4,10,12-24	13000	INCOMPLETE PUSH
23.42	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 05,1984
Chainage :Start 2197.38 m
End 2216.94 m
Advance for day 19.56 m

File Name: DY09-05A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	-- SHIFT CHANGE------					
0.18	0.31	MAINTENANCE		-	-	-	CLEAN UP SPILLAGE AT CHUTE
0.31	0.48	MINING		-	-	-	INCOMPLETE PUSH
0.48	1.09	DELAY					NO. 1 BELT SLIPPING
1.09	1.17	MINING		-	-	-	INCOMPLETE PUSH
1.17	1.30	DELAY					NO. 1 BELT SLIPPING
1.30	1.36	MINING		1.20	3-8,13-24	10500	COMPLETED PUSH
1.36	1.52	RING INSTALLATION	1467				
1.52	2.42	MINING		1.50	3-8,13-24	11000	-
2.42	2.54	RING INSTALLATION	1468				
2.54	2.57	MINING		-	-	-	INCOMPLETE PUSH
2.57	3.07	DELAY					NO.1 BELT SLIPPING
3.07	3.57	MINING		1.50	3,4,9,11,13-24	13500	COMPLETED PUSH
3.57	4.10	RING INSTALLATION	1469				
4.10	4.40	LUNCH					
4.40	5.28	MINING		1.50	3,4,9,11,13-24	13500	-
5.28	5.43	RING INSTALLATION	1470				
5.43	6.30	MINING		1.50	3,4,9-16,20-24	14000	-
6.30	6.41	RING INSTALLATION	1471				
6.41	7.38	MINING		1.50	3,4,9-16,20-24	14000	-
7.38	7.45	RING INSTALLATION	1472				
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #8,39,42B,43A. PINNED RING #1470
12.00	12.30	LUNCH					
12.30	14.50	MAINTENANCE					END CUTTER CHANGE
14.50	15.45	MINING & DELAY		1.20	16	11000	POWER TROUBLE WITH T.B.M.
15.45	16.17	-- SHIFT CHANGE------					INCOMPLETE PUSH
16.17	16.30	MINING		0.30	3,4,9-24	11000	COMPLETED PUSH
16.30	16.40	RING INSTALLATION	1473				
16.40	17.27	MINING		1.50	3,4,9-24	11000	-
17.27	17.37	RING INSTALLATION	1474				
17.37	18.25	MINING		1.50	3,4,9-24	12000	-
18.25	18.37	RING INSTALLATION	1475				
18.37	19.27	MINING		1.50	3,4,9-24	12000	-
19.27	19.40	RING INSTALLATION	1476				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 05,1984 — File Name: DY09-05A
Chainage :Start 2197.38 m
End 2216.94 m — Project No: 831-6014
Advance for day 19.56 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Pressure (kPa)	Comments
19.40	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.00	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
21.00	21.12	RING INSTALLATION	1477				
21.12	22.02	MINING		1.50	3,4,9-24	13000	-
22.02	22.15	RING INSTALLATION	1478				
22.15	23.05	MINING		1.50	3,4,9-24	13000	-
23.05	23.16	RING INSTALLATION	1479				
23.16	23.40	MINING		0.70	3,4,9-24	13000	INCOMPLETE PUSH
23.40	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 06.1984
Chainage :Start 2216.94 m
End 2235.14 m
Advance for day 18.20 m

File Name: DY09-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	-- SHIFT CHANGE------					
0.18	0.57	MINING		0.80	3,4,17-24	13500	COMPLETED PUSH
0.57	1.13	RING INSTALLATION	1480				
1.13	2.11	MINING		1.50	3,4,17-24	14000	-
2.11	2.20	RING INSTALLATION	1481				
2.20	3.17	MINING		1.50	3,4,13-24	12500	-
3.17	3.30	RING INSTALLATION	1482				
3.30	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.11	MINING		1.50	3,4,17-24	13000	COMPLETED PUSH
5.11	5.27	RING INSTALLATION	1483				
5.27	5.37	DELAY					CHECK CUTTERS
5.37	6.49	MINING		1.50	3,4,13-24	12500	-
6.49	7.02	RING INSTALLATION	1484				
7.02	7.45	MINING		1.20	3,4,13-24	13000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS PINNED RING #1483 ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.10	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.10	14.16	MINING		-	-	-	INCOMPLETE PUSH
14.16	14.20	DELAY					ELECTRICAL(CHANGED CONTROLS ON T.B.M.)
14.20	14.25	MINING		0.30	14	12000	COMPLETED PUSH
14.25	14.40	RING INSTALLATION	1485				
14.40	15.45	MINING		1.50	14	12000	-
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.35	RING INSTALLATION	1486				
16.35	17.24	MINING		1.50	3,4,13-24	12000	-
17.24	17.36	RING INSTALLATION	1487				
17.36	18.30	MINING		1.50	3,4,13-24	12000	-
18.30	18.44	RING INSTALLATION	1488				
18.44	19.32	MINING		1.50	3,4,13-24	12000	-
19.32	19.42	RING INSTALLATION	1489				
19.42	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 06.1984 File Name: DY09-06A
Chainage :Start 2216.94 m
End 2235.14 m Project No: 831-6014
Advance for day 18.20 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.30	21.04	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
21.04	21.20	RING INSTALLATION	1490				
21.20	22.12	MINING		1.50	3,4,13-24	12000	-
22.12	22.25	RING INSTALLATION	1491				
22.25	22.40	MINING		0.40	3,4,13-24	12000	INCOMPLETE PUSH
22.40	23.25	DELAY					LEAKING HYDRLC. FITTING ON PUMP NO. 12
23.25	23.40	MINING		0.50	3,4,13-24	12000	INCOMPLETE PUSH
23.40	24.00	-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: SEPTEMBER 07,1984
Chainage :Start 2235.14 m
End 2254.68 m
Advance for day 19.54 m

File Name: DY09-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.42	MINING		0.60	3,4,10,14, 17-24	13500	COMPLETED PUSH
0.42	0.58	RING INSTALLATION	1492				
0.58	1.49	MINING		1.50	3,4,14,16-24	14500	-
1.49	2.02	RING INSTALLATION	1493				
2.02	2.49	MINING		1.50	3,4,13-24	12500	-
2.49	3.04	RING INSTALLATION	1494				
3.04	3.55	MINING		1.50	3,4,10-24	12500	-
3.55	4.25	LUNCH					
4.25	4.46	RING INSTALLATION	1495				
4.46	5.16	MINING		-	-	-	INCOMPLETE PUSH
5.16	5.27	DELAY					BELT STOPPED(CHUTE PLUGGED)
5.27	6.04	MINING		1.50	3,4,10-24	12500	COMPLETED PUSH
6.04	6.19	RING INSTALLATION	1496				
6.19	7.09	MINING		1.50	3,4,10-24	13000	-
7.09	7.18	RING INSTALLATION	1497				
7.18	7.27	MINING		-	-	-	INCOMPLETE PUSH
7.27	7.32	DELAY					COMPLETED RING #1497 INSTALLATION
7.32	7.45	MINING		0.60	3,4,10-24	13000	INCOMPLETE PUSH
7.45	8.15	-- SHIFT CHANGE------					
8.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #9,17,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.20	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.20	14.02	MINING		1.09	5/7,6/8	12500	COMPLETED PUSH
14.02	14.32	RING INSTALLATION	1498				
14.32	15.05	MINING		-	-	-	INCOMPLETE PUSH
15.05	15.08	DELAY					POWER OUTAGE ON T.B.M.
15.08	15.32	MINING		1.50	1-24	10000	COMPLETED PUSH
15.32	15.45	RING INSTALLATION	1499				PARTIAL INSTALLATION
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.30	RING INSTALLATION	1499				COMPLETED INSTALLATION
16.30	17.20	MINING		1.50	3,4,9-24	13000	-
17.20	17.28	RING INSTALLATION	1500				
17.28	18.13	MINING		1.50	3,4,9-24	13000	-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 07,1984
Chainage :Start 2235.14 m
End 2254.68 m
Advance for day 19.54 m

File Name: DY09-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.15	18.28	RING INSTALLATION	1501				
18.28	19.16	MINING		1.50	3,4,9-24	13000	-
19.16	19.26	RING INSTALLATION	1502				
19.26	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.45	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
20.45	21.00	RING INSTALLATION	1503				
21.00	21.20	MINING		-	-	-	INCOMPLETE PUSH
21.20	22.00	DELAY					PRIMARY CONVEYOR JAMMED WITH MUCK
22.00	22.23	MINING		-	-	-	INCOMPLETE PUSH
22.23	22.27	DELAY					POWER OFF ON T.B.M.
22.27	22.30	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
22.30	22.40	RING INSTALLATION	1504				
22.40	23.10	MINING		0.75	3,4,9-24	13000	INCOMPLETE PUSH
23.10	23.40	DELAY					BELT LINE DOWN(NO.1 BELT TRIPPED OFF)
23.40	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel @ 2)

Date SEPTEMBER 08,1984
Chainage :Start 2254.68 m
End 2263.16 m
Advance for day 8.48 m

File Name: DY09-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.19	-- SHIFT CHANGE------					
0.19	0.45	MINING		0.75	3,4,13-24	13000	COMPLETED PUSH
0.45	0.59	RING INSTALLATION	1505				
0.59	1.57	MINING		1.50	3-9,11,13-16, 20-24	12500	-
1.57	2.12	RING INSTALLATION	1506				
2.12	3.10	MINING		1.50	3-11,13-24	11500	-
3.10	3.26	RING INSTALLATION	1507				
3.26	4.05	MINING		-	-	-	INCOMPLETE PUSH
4.05	4.35	LUNCH					
4.35	4.49	MINING		1.50	3,4,9-24	13500	COMPLETED PUSH
4.49	5.07	RING INSTALLATION	1508				
5.07	6.00	MINING		1.50	3,4,9-24	13000	-
6.00	6.18	RING INSTALLATION	1509				
6.18	7.10	MINING		1.50	3,4,9,11,13-24	12500	-
7.10	7.24	RING INSTALLATION	1510				
7.24	7.45	MINING		0.50	3-5,7,9,11, 13-24	11000	INCOMPLETE PUSH
7.45	8.00	-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 10,1984
Chainage :Start 2263.16 m
End 2271.28 m
Advance for day 8.12 m

File Name: DY09-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO ADVANCE RECORDED					
8.00	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.35	MAINTENANCE		-	-	-	CHANGED CUTTERS #43,10,42,15 ASSORTED MACHINE MAINTENANCE
14.35	15.16	MINING		1.08	3-5,7,9,11, 13-24	9500	PINNED RING #1509 WITH 4 SETS OF PINS COMPLETED PUSH
15.16	15.26	DELAY		-	-	-	WAITING FOR SPECIAL SET
15.26	15.45	RING INSTALLATION	1511				
15.45	16.20	-- SHIFT CHANGE------					
16.20	17.08	MINING		-	17	10000	INCOMPLETE PUSH
17.08	17.15	DELAY		-	-	-	INSTALL MESH
17.15	17.25	MINING		1.04	-	-	COMPLETE PUSH-SHORTER SPACING
17.25	17.40	RING INSTALLATION	1512				
17.40	18.20	MINING		1.00	17	13000	-
18.20	18.35	RING INSTALLATION	1513				
18.35	19.15	MINING		-	17	13000	INCOMPLETE PUSH
19.15	19.30	RING INSTALLATION	1514				
19.30	19.45	MINING		1.00	17	13000	COMPLETED PUSH
19.45	20.00	DELAY		-	-	-	INSTALL MESH
20.00	20.30	LUNCH					
20.30	20.50	MINING		1.00	13	13000	-
20.50	21.05	RING INSTALLATION	1515				
21.05	21.50	MINING		1.00	16	13000	-
21.50	22.05	RING INSTALLATION	1516				
22.05	22.40	MINING		1.00	14	13000	-
22.40	22.55	RING INSTALLATION	1517				
22.55	23.30	MINING		1.00	15	13000	-
23.30	23.40	RING INSTALLATION	1518				
23.40	24.00	-- SHIFT CHANGE------					

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES TOTAL NUMBER OF RAMS IN USE, NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 10,1984
Chainage :Start 2263.16 m
End 2271.28 m
Advance for day 8.12 m

File Name: DY09-10A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.35	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,15,42,43. ASSORTED MACHINE MAINTENANCE PINNED RING #1509 WITH 4 SETS OF PINS
14.35	15.16	MINING		1.08	3-5,7,9,11, 13-24	9500	COMPLETED PUSH
15.16	15.26	DELAY					WAIT FOR SPECIAL SET OF RINGS
15.26	15.45	RING INSTALLATION	1511				
15.45	16.20	-- SHIFT CHANGE------					
16.20	17.08	MINING		-	17	10000	INCOMPLETE PUSH
17.08	17.15	DELAY					INSTALL MESH
17.15	17.25	MINING		1.04	-	-	COMPLETED PUSH(SHORTER SPACING)
17.25	17.40	RING INSTALLATION	1512				
17.40	18.20	MINING		1.00	17	13000	-
18.20	18.35	RING INSTALLATION	1513				
18.35	19.15	MINING		-	17	13000	INCOMPLETE PUSH
19.15	19.30	RING INSTALLATION	1514				
19.30	19.45	MINING		1.00	17	13000	COMPLETED PUSH
19.45	20.00	DELAY					INSTALL MESH
20.00	20.30	LUNCH					
20.30	20.50	MINING		1.00	13	13000	-
20.50	21.05	RING INSTALLATION	1515				
21.05	21.50	MINING		1.00	16	13000	-
21.50	22.05	RING INSTALLATION	1516				
22.05	22.40	MINING		1.00	14	13000	-
22.40	22.55	RING INSTALLATION	1517				
22.55	23.30	MINING		1.00	15	13000	-
23.30	23.40	RING INSTALLATION	1518				
23.40	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 11,1984 File Name: DY09-11A
Chainage :Start * 2273.78 m
End 2286.50 m Project No: 831-6014
Advance for day 12.72 m

Time (hours)		Activity	Ring	Advance	Push Cylinder		Comments
Start	End		No.	(m)	In use	Pressure (kPa)	
0.00	0.20	-- SHIFT CHANGE------					
0.20	1.05	MINING		0.96	3,4,9-24	11000	COMPLETED PUSH
1.05	1.25	RING INSTALLATION	1519				
1.25	2.05	MINING		1.00	3,4,9-24	11000	-
2.05	2.17	RING INSTALLATION	1520				
2.17	3.00	MINING		1.00	3,4,9-24	11000	-
3.00	3.15	RING INSTALLATION	1521				
3.15	4.00	MINING		1.00	3,4,9-24	12000	-
4.00	4.15	RING INSTALLATION	1522				
4.15	4.45	LUNCH					
4.45	5.00	DELAY					NO WATER
5.00	5.35	MINING		1.00	3,4,9-24	13000	-
5.35	5.55	RING INSTALLATION	1523				
5.55	6.35	MINING		1.00	3,4,9-24	13000	-
6.35	6.54	RING INSTALLATION	1524				
6.54	7.25	MINING		-	-	-	INCOMPLETE PUSH
7.25	7.35	DELAY					INSTALL MESH
7.35	7.45	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							CHANGED CUTTERS #13,14,42A,43B.
12.00	12.30	LUNCH					
12.30	15.00	MAINTENANCE		-	-	-	PINNED RING #1522 WITH 4 SETS OF PINS
							ASSORTED MACHINE MAINTENANCE
15.00	15.26	RING INSTALLATION	1525				ALSO EXPAND RING #1523
15.26	15.45	MINING		0.40	3,4,9-24	14000	INCOMPLETE PUSH
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.50	DELAY					INSTALL MESH & RIB SUPPORT
16.50	17.20	MINING		0.60	16	21000-?	COMPLETED PUSH
17.20	17.40	RING INSTALLATION	1526				
17.40	18.20	MINING		1.00	18	17000	-
18.20	18.35	RING INSTALLATION	1527				
18.35	19.10	MINING		1.00	15	15000	-
19.10	19.30	RING INSTALLATION	1528				
19.30	20.00	MINING		-	18	14000	INCOMPLETE PUSH
20.00	20.30	LUNCH					

Notes: * VARIATION BETWEEN YESTERDAYS DAY-END CHAINAGE & TODAYS START CHAINAGE.
RECORDED CHAINAGE ON 10-09-84 SHEETS HAVE BEEN ALTERED
SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES NUMBER OF RAMS IN USE, NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 11,1984
Chainage :Start @ 2273.78 m
End 2286.50 m
Advance for day 12.72 m

File Name: DY09-11A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
20.30	20.50	MINING		1.50	18	14000	COMPLETED PUSH(LONGER SPACING)
20.50	21.05	RING INSTALLATION	1529				
21.05	21.55	MINING		1.50	15	14000	-
21.55	22.05	RING INSTALLATION	1530				
22.05	23.00	MINING		1.50	19	14000	-
23.00	23.15	RING INSTALLATION	1531				
23.15	23.45	MINING		0.76	18	14000	INCOMPLETE PUSH
23.45	24.00	-- SHIFT CHANGE------					

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES NUMBER OF RAMS IN USE, NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 12,1984 File Name: DY09-12A
Chainage :Start 2286.50 m
End 2308.24 m Project No: 831-6014
Advance for day 21.74 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.45	MINING		0.74	3,4,11-24	11000	COMPLETED PUSH
0.45	0.55	RING INSTALLATION	1532				
0.55	1.46	MINING		1.50	,3,4,11-24	11000	-
1.46	1.57	RING INSTALLATION	1533				
1.57	2.30	MINING		-	-	-	INCOMPLETE PUSH
2.30	2.35	DELAY		-	-	-	SECONDARY BELT DOWN
2.35	2.52	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
2.52	3.03	RING INSTALLATION	1534				
3.03	3.57	MINING		1.50	3,4,11-24	12000	-
3.57	4.12	RING INSTALLATION	1535				
4.12	4.42	LUNCH					
4.42	5.47	MINING		1.50	3,4,11-24	12000	-
5.47	6.00	RING INSTALLATION	1536				
6.00	6.51	MINING		1.50	3,4,11-24	12000	-
6.51	7.05	RING INSTALLATION	1537				
7.05	7.22	DELAY-?		-	-	-	WATER AT FACE
7.22	7.40	MINING		0.50	3,4,11-24	12000	INCOMPLETE PUSH
7.40	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED 4 CUTTERS
12.00	12.30	LUNCH					
12.30	13.04	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
13.04	13.09	MINING		-	-	-	INCOMPLETE PUSH
13.09	13.23	DELAY		-	-	-	POWER TROUBLE ON T.B.M.
13.23	13.56	MINING		1.00	3,4,13-24	10500	COMPLETED PUSH
13.56	14.06	RING INSTALLATION	1538				
14.06	14.57	MINING		1.50	3,4,13-24	10500	-
14.57	15.09	RING INSTALLATION	1539				
15.09	15.45	MINING		1.20	3,4,13-24	10000	INCOMPLETE PUSH
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.35	MINING		0.30	14	14000	COMPLETED PUSH
16.35	16.50	RING INSTALLATION	1540				
16.50	17.40	MINING		1.50	10	20000	-
17.40	17.50	RING INSTALLATION	1541				
17.50	18.45	MINING		1.50	10	20000	-

Notes: SINGLE NUMBER IN "IN USE" COLUMN DENOTES TOTAL NUMBER OF RAMS IN USE,NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 12,1984
Chainage :Start 2286.50 m
End 2308.24 m
Advance for day 21.74 m

File Name: DY09-12A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
18.45	19.00	RING INSTALLATION	1542				
19.00	19.50	MINING		1.50	14	14000	-
19.50	20.00	RING INSTALLATION	1543				
20.00	20.30	LUNCH					
20.30	21.25	MINING		1.50	14	17000	-
21.25	21.40	RING INSTALLATION	1544				
21.40	22.25	MINING		1.50	14	17000	-
22.25	22.40	RING INSTALLATION	1545				
22.40	23.30	MINING		1.50	16	13000	-
23.30	23.45	RING INSTALLATION	1546				
		-- SHIFT CHANGE------					

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES TOTAL NUMBER OF RAMS IN USE,NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 13,1984 File Name: DY09-13A
Chainage :Start 2308.24 m
End 2331.74 m Project No: 831-6014
Advance for day 23.50 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	1.10	MINING		1.50	3,4,13-24	11000	-
1.20	1.25	RING INSTALLATION	1547				
1.25	2.12	MINING		1.50	3,4,13-24	11000	-
2.12	2.23	RING INSTALLATION	1548				
2.23	3.05	MINING		1.50	3,4,13-24	11000	-
3.05	3.15	RING INSTALLATION	1549				
3.15	4.00	MINING		1.50	3,4,13-24	12000	-
4.00	4.15	RING INSTALLATION	1550				
4.15	4.45	LUNCH					
4.45	5.45	MINING		1.50	3,4,13-24	12000	-
5.45	6.00	RING INSTALLATION	1551				
6.00	6.50	MINING		1.50	3,4,13-24	12000	-
6.50	7.01	RING INSTALLATION	1552				
7.01	7.41	MINING		1.20	3,4,13-24	12000	INCOMPLETE PUSH
7.41	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED 4 CUTTERS SPLICING BELTS
12.00	12.30	LUNCH					
12.30	13.08	MAINTENANCE		-	-	-	SET UP FOR MINING
13.08	13.19	MINING		0.30	3,4,13-24	9000	COMPLETED PUSH
13.19	13.30	RING INSTALLATION	1553				
13.30	14.08	MINING		1.50	3,4,13-24	9000	-
14.08	14.20	RING INSTALLATION	1554				
14.20	15.01	MINING		1.50	3.4.13-24	9000	-
15.01	15.15	RING INSTALLATION	1555				
15.15	15.45	MINING		1.00	3,4,13-24	9500	INCOMPLETE PUSH
15.45	16.20	-- SHIFT CHANGE------					
16.20	16.45	MINING		0.50	16	13000	COMPLETED PUSH
16.45	17.00	RING INSTALLATION	1556				
17.00	17.50	MINING		1.50	14	15000	-
17.50	18.00	RING INSTALLATION	1557				
18.00	18.50	MINING		1.50	14	16000	-
18.50	19.00	RING INSTALLATION	1558				
19.00	19.50	MINING		1.50	16	14000	-

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES NUMBER OF RAM IN USE, NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 13,1984
Chainage :Start 2308.24 m
End 2331.74 m
Advance for day 23.50 m

File Name: DY09-13A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
19.30	20.00	RING INSTALLATION	1559				
20.00	20.30	LUNCH					
20.30	21.30	MINING		1.50	15	17000	-
21.30	21.45	RING INSTALLATION	1560				
21.45	22.45	MINING		1.50	13	16000	-
22.45	23.00	RING INSTALLATION	1561				
23.00	23.45	MINING		1.00	13	17000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES TOTAL NUMBER OF RAMS IN USE, NOT WHICH ONE

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 14,1984 File Name: DY09-14A
Chainage :Start 2331.74 m
End 2346.69 m Project No: 831-6014
Advance for day 14.95 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.40	MINING		0.50	3-8,13-24	11000	COMPLETED PUSH
0.40	0.55	RING INSTALLATION	1562				
0.55	1.55	MINING		1.50	3-8,13-24	11000	-
1.55	2.09	RING INSTALLATION	1563				
2.09	2.58	MINING		1.50	3-8,13-24	11000	-
2.58	3.10	RING INSTALLATION	1564				
3.10	4.02	MINING		1.50	3-8,13-24	11000	-
4.02	4.15	RING INSTALLATION	1565				
4.15	4.45	LUNCH					
4.45	6.50	DELAY		-	-	-	BROKEN IMPELLER ON PUMP
6.50	7.40	MINING		1.20	3-8,13-24	11000	INCOMPLETE PUSH
7.40	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS #43B,42A,26,40.
12.00	12.30	LUNCH					
12.30	13.14	MAINTENANCE		-	-	-	COMPLETE MAINTENANCE
13.14	13.26	MINING		0.30	3-8,13-24	8500	COMPLETED PUSH
13.26	13.41	RING INSTALLATION	1566				
13.41	14.33	MINING		1.50	3-8,13-24	9000	-
14.33	14.44	RING INSTALLATION	1567				
14.44	15.04	MINING		-	-	-	INCOMPLETE PUSH
15.04	15.07	DELAY		-	-	-	SECONDARY BELT TRIPPED OFF
15.07	15.16	MINING		-	-	-	INCOMPLETE PUSH
15.16	15.25	DELAY		-	-	-	POWER TRIPPED OFF TO T.B.M.
15.25	15.42	MINING		1.50	3-8,12-24	9500	COMPLETED PUSH
15.42	16.20	-- SHIFT CHANGE------					
16.20	16.40	RING INSTALLATION	1568				
16.40	17.30	MINING		1.50	18	15000	-
17.30	17.40	RING INSTALLATION	1569				
17.40	18.35	MINING		1.50	18	15000	-
18.35	18.45	RING INSTALLATION	1570				
18.45	19.40	MINING		1.50	18	15000	-
19.40	19.50	RING INSTALLATION	1571				
19.50	20.00	MINING		-	-	19000	INCOMPLETE PUSH
20.00	20.30	LUNCH					

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES TOTAL NUMBER OF RAMS IN USE, NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY09-14A

Date: SEPTEMBER 14,1984
Chainage: Start 2331.74 m
End 2346.69 m
Advance for day 14.95 m

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.30	21.05	MINING		0.95	14	19000	INCOMPLETE PUSH
21.05	23.40	DELAY		-	-	-	POWER OFF
23.40	24.00	-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date: SEPTEMBER 15,1984
Chainage: Start 2346.69 m
End 2351.24 m
Advance for day 4.55 m

File Name: DY09-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	1.00	DELAY		-	-	-	ELECTRICAL PROBLEMS WITH TRANSFORMER
1.00	1.20	MINING		0.55	3,4,13-24	13000	COMPLETED PUSH
1.20	1.33	RING INSTALLATION	1572				
1.33	2.15	MINING		-	-	-	INCOMPLETE PUSH
2.15	3.25	DELAY		-	-	-	POWER OFF (TRANSFORMER TRIP RELAY)
3.25	3.42	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
3.42	3.55	RING INSTALLATION	1573				
3.55	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.20	MINING		-	-	-	INCOMPLETE PUSH
5.20	6.20	DELAY		-	-	-	? "MISC" -POSSIBLE INJURY AT FACE?
6.20	6.45	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
6.45	7.00	RING INSTALLATION	1574				
7.00	7.30	MINING		1.00	3,4,13-24	13000	
7.30	7.40	DELAY		-	-	-	CLEAN UP
7.40	8.00	-- SHIFT CHANGE------		-	-	-	END OF DAY'S WORK WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 17,1984
Chainage :Start 2351.11 m REVISED
End 2360.65 m
Advance for day 9.54 m

File Name: DY09-17A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Pressure (kPa)	Comments
8.00	8.20	— SHIFT CHANGE———					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED 4 CUTTERS
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #1575
12.00	12.30	LUNCH					
12.30	13.20	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
13.20	13.40	MINING		0.54	3-8,13-24	12000	COMPLETED PUSH
13.40	13.55	RING INSTALLATION	1575				
13.55	14.06	MINING		-	-	-	INCOMPLETE PUSH
14.06	15.06	DELAY		-	-	-	BROKEN HYDRAULIC HOSE.
15.06	15.43	MINING		1.00	3-8,13-24	12000	INCOMPLETE PUSH
15.43	16.20	— SHIFT CHANGE———					
16.20	16.38	MINING		0.50	3-8,13-24	9500	COMPLETED PUSH
16.38	16.53	RING INSTALLATION	1576				
16.53	17.22	MINING		-	-	-	INCOMPLETE PUSH
17.22	17.27	DELAY		-	-	-	INST'D SPACERS AND WEDGES
17.27	17.53	MINING		1.50	3-8,13-24	10000	-
17.53	18.06	RING INSTALLATION	1577				
18.06	18.38	MINING		-	-	-	INCOMPLETE PUSH
18.38	18.49	DELAY		-	-	-	INST'D SPACERS
18.49	19.12	MINING		1.50	3-8,11,13-24	12000	-
19.12	19.25	RING INSTALLATION	1578				
19.25	19.54	MINING		-	-	-	INCOMPLETE PUSH
19.54	20.00	DELAY		-	-	-	INST'D SPACERS
20.00	20.30	LUNCH					
20.30	20.43	DELAY		-	-	-	TROUBLE WITH TAIL PULLEY #2 DRIVE
20.43	21.16	MINING		1.50	3-8,11,13-24	11000	COMPLETED PUSH
21.16	21.29	RING INSTALLATION	1579				
21.29	21.58	MINING		-	-	-	INCOMPLETE PUSH
21.58	22.02	DELAY		-	-	-	INST'D SPACERS
22.02	22.28	MINING		1.50	3,4,11-24	11500	COMPLETED PUSH
22.28	22.40	RING INSTALLATION	1580				
22.40	23.07	MINING		-	-	-	INCOMPLETE PUSH
23.07	23.11	DELAY		-	-	-	INST'D SPACERS
23.11	23.44	MINING		1.50	3,4,13-24	13500	COMPLETED PUSH
23.44	24.00	— SHIFT CHANGE———					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 18,1984 File Name: DY09-18A
Chainage :Start 2360.65 m
End 2371.15 m Project No: 831-6014
Advance for day 10.50 m

Time (hours)		Activity	Ring	Advance	Push Cylinder		Comments
Start	End		No.	(m)	In use	Pressure (kPa)	
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.40	RING INSTALLATION	1581				
0.40	1.40	MINING		1.50	16	16000	-
1.40	1.55	RING INSTALLATION	1582				
1.55	3.10	MINING		1.50	17	17000	-
3.10	3.25	RING INSTALLATION	1583				
3.25	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.50	MINING		1.50	16	16000	COMPLETED PUSH
4.50	5.00	RING INSTALLATION	1584				
5.00	5.55	MINING		1.50	17	15000	-
5.55	6.10	RING INSTALLATION	1585				
6.10	7.00	MINING		1.50	17	18000	-
7.00	7.10	RING INSTALLATION	1586				
7.10	7.45	MINING		1.00	16	17000	INCOMPLETE PUSH
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							PINNED RING # 1584
							CHANGED 4 CUTTERS
12.00	12.30	LUNCH					
12.30	13.00	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.
13.00	13.30	MINING		0.50	3-8,13-1621-24	15000	COMPLETED PUSH
13.30	13.43	RING INSTALLATION	1587				
13.43	14.46	MINING		1.50	3-8,13-1621-24	15000	-
14.46	15.00	RING INSTALLATION	1588				
15.00	15.15	MINING		0.50	3-8,13-1621-24	15000	INCOMPLETE PUSH
15.15	15.45	DELAY		-	-	-	BEARING ON #3 DRIVE ---?
15.45	16.20	-- SHIFT CHANGE------					
16.20	23.45	MAINTENANCE & DELAY?		-	-	-	CHANGED BEARINGS ON DRIVE ROLLER ON #3 DRIVE
							ASSORTED MACHINE MAINTENANCE
							DRILLED OFF MANWAYS
							REGULAR LUNCH BREAK (30 MIN) INCLUDED
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date SEPTEMBER 19,1984
Chainage :Start 2371.65 m
End 2390.25 m
Advance for day 18.60 m

File Name: DY09-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.25	-- SHIFT CHANGE------					
0.25	1.10	MINING		1.00	16	17000	COMPLETED PUSH
1.10	1.25	RING INSTALLATION	1589				
1.25	2.35	MINING		1.50	16	16000	-
2.35	2.45	RING INSTALLATION	1590				
2.45	3.45	MINING		1.50	16	17000	-
3.45	4.00	RING INSTALLATION	1591				
4.00	4.30	LUNCH					
4.30	5.30	MINING		1.50	17	16000	-
5.30	5.40	RING INSTALLATION	1592				
5.40	6.40	MINING		1.50	16	18000	-
6.40	6.55	RING INSTALLATION	1593				
6.55	7.45	MINING		1.20	17	20000	INCOMPLETE PUSH
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS 843A,13,42D,22. PINNED RING #1591
12.00	12.30	LUNCH					
12.30	12.55	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.
12.55	13.45	MINING		0.30	3,4,13-24	15000	T.B.M. WAS VERY TIGHT
13.45	13.55	RING INSTALLATION	1594				
13.55	14.58	MINING		1.50	14,16,17-24	15000	-
14.58	15.10	RING INSTALLATION	1595				
15.10	15.40	MINING		0.70	14,16-24	15000	INCOMPLETE PUSH
15.40	16.18	-- SHIFT CHANGE------					
16.18	16.29	MINING		-	-	-	INCOMPLETE PUSH
16.29	16.33	DELAY		-	-	-	INST'D SPACERS
16.33	16.55	MINING		0.80	3,4,12-24	12000	COMPLETED PUSH
16.55	17.10	RING INSTALLATION	1596				TROUBLE LINING UP RING
17.10	17.48	MINING		-	-	-	INCOMPLETE PUSH
17.48	17.53	DELAY		-	-	-	INST'D SPACERS
17.53	18.26	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH-T.B.M. CUT OUT SEVERAL TIMES
18.26	18.38	RING INSTALLATION	1597				
18.38	19.13	MINING		-	-	-	INCOMPLETE PUSH
19.13	19.17	DELAY		-	-	-	INST'D SPACERS
19.17	19.45	MINING		1.50	3,4,13-24	11500	COMPLETED PUSH

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES TOTAL NUMBER OF RAMS IN USE, NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date: SEPTEMBER 19,1984 File Name: DY09-19A

Chainage :Start 2371.65 m

End 2390.25 m Project No: 831-6014

Advance for day 18.60 m

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
19.45	19.56	RING INSTALLATION	1598				
19.56	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.40	LUNCH					
20.40	21.06	MINING		-	-	-	INCOMPLETE PUSH
21.06	21.11	DELAY		-	-	-	INST'D SPACERS
21.11	21.40	MINING		1.50	3,4,12-24	11500	COMPLETED PUSH
21.40	21.54	RING INSTALLATION	1599				
21.54	22.26	MINING		-	-	-	INCOMPLETE PUSH
22.26	22.31	DELAY		-	-	-	INST'D SPACERS
22.31	22.52	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
22.52	23.04	RING INSTALLATION	1600				
23.04	23.44	MINING		1.10	3,4,12-24	11000	INCOMPLETE PUSH
23.44	24.00	-- SHIFT CHANGE					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 20,1984
Chainage :Start 2390.25 m
End 2404.75 m
Advance for day 14.50 m

File Name: DY09-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.30	MINING		0.40	14	17000	COMPLETED PUSH
0.30	0.45	RING INSTALLATION	1601				
0.45	1.50	MINING		1.50	16	16000	-
1.50	2.05	RING INSTALLATION	1602				
2.05	3.00	MINING		1.50	16	15000	SECONDARY BELT SHUT OFF-2:50-2:55.
3.00	3.15	RING INSTALLATION	1603				
3.15	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.05	MINING		1.50	16	16-17000	COMPLETED PUSH LOST POWER DURING PUSH (10 MIN.)
5.05	5.15	RING INSTALLATION	1604				
5.15	6.15	MINING		1.50	16	18000	-
6.15	6.30	RING INSTALLATION	1605				
6.30	7.45	MINING		1.30	16	20000	INCOMPLETE PUSH
7.45	8.20	-- SHIFT CHANGE------					INST'D MESH FOR 10 MIN.
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #42A,43B,43A,42B,37. ASSORTED MACHINE MAINTENANCE PINNED RING #1604
12.00	12.30	LUNCH					
12.30	14.20	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
14.20	14.38	MINING		0.20	3-8,13-24	16000	COMPLETED PUSH
14.38	14.48	RING INSTALLATION	1606				
14.48	15.12	MINING		-	-	-	INCOMPLETE PUSH
15.12	15.14	DELAY		-	-	-	CHANGE HOSE ON GREASE PUMP
15.14	15.40	MINING		0.60	3-8,13-24	13000	INCOMPLETE PUSH
15.40	16.19	-- SHIFT CHANGE------					
16.19	16.36	MINING		-	-	-	INCOMPLETE PUSH
16.36	16.41	DELAY		-	-	-	INST'D SPACERS
16.41	17.07	MINING		0.90	3-8,13-24	11000	COMPLETED PUSH
17.07	17.21	RING INSTALLATION	1607				
17.21	18.24	MINING		-	-	-	INCOMPLETE PUSH
18.24	18.28	DELAY		-	-	-	INST'D SPACERS
18.28	19.00	MINING		1.50	3-8,12-24	10000	COMPLETED PUSH
19.00	19.12	RING INSTALLATION	1608				
19.12	19.52	MINING		-	-	-	INCOMPLETE PUSH
19.52	19.56	DELAY		-	-	-	INST'D SPACERS

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES TOTAL NUMBER OF RAMS IN USE, NOT WHICH ONE.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 20,1984
Chainage :Start 2390.25 m
End 2404.75 m
Advance for day 14.50 m

File Name: DY09-20A

Project No: 831-6014

Time (hours)		Activity	Ring	Advance	Push Cylinder		Comments
Start	End		No.	(m)	In use	Pressure (kPa)	
19.56	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.40	LUNCH					
20.40	21.11	MINING		1.50	3,4,11,13-24	12500	COMPLETED PUSH
21.11	21.27	RING INSTALLATION	1609				
21.27	22.07	MINING		-	-	-	INCOMPLETE PUSH
22.07	22.10	DELAY		-	-	-	INST'D SPACERS
22.10	22.45	MINING		1.50	3,4,11,13-24	12500	COMPLETED PUSH (TBM CUT OUT FREQUENTLY)
22.45	22.57	RING INSTALLATION	1610				
22.57	23.45	MINING		0.60	3,4,11,13-24	12500	INCOMPLETE PUSH
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 21,1984
Chainage :Start 2404.75 m
End 2420.89 m
Advance for day 16.14 m

File Name: DY09-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.55	MINING		0.90	16	17000	COMPLETED PUSH
0.55	1.10	RING INSTALLATION	1611				
1.10	2.25	MINING		1.50	16	18000	-
2.25	2.40	RING INSTALLATION	1612				
2.40	3.35	MINING		1.50	16	18000	-
3.35	3.50	RING INSTALLATION	1613				
3.50	4.10	MINING		-	16	17000	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	5.25	MINING		1.50	16	18000	COMPLETED PUSH
5.25	5.45	RING INSTALLATION	1614				
5.45	6.30	MINING		1.50	16	18000	-
6.30	6.45	RING INSTALLATION	1615				
6.45	7.45	MINING		1.50	,16	17000	-
7.45	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE PINNED RING #1613 CHANGED CUTTERS #43A,42B,40,33.
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
15.40	16.15	-- SHIFT CHANGE------					
16.15	16.30	RING INSTALLATION	1616				
16.30	17.42	MINING		1.50	3,4,9-24	12000	-
17.42	17.52	RING INSTALLATION	1617				
17.52	18.51	MINING		1.50	3,4,9-24	12000	-
13.51	19.00	RING INSTALLATION	1618				
19.00	19.31	MINING		-	-	-	INCOMPLETE PUSH
19.31	19.43	DELAY		-	-	-	EXPAND RING # 1617.
19.43	19.53	MINING		-	3-24	10000	INCOMPLETE PUSH
19.53	20.03	DELAY		-	-	-	PRIMARY BELT STOPPED
20.03	20.18	MINING		1.50	3-24	10000	COMPLETED PUSH
20.18	20.29	RING INSTALLATION	1619				
20.29	21.00	LUNCH					
21.00	22.05	MINING		1.50	3,4,13-24	16000	-
22.05	22.18	RING INSTALLATION	1620				
22.18	22.43	MINING		-	-	-	INCOMPLETE PUSH

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES NUMBER OF RAMS IN USE, NOT WHICH ONES.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 21,1984 File Name: DY09-21A
Chainage :Start 2404.75 m
End 2420.89 m Project No: 831-6014
Advance for day 16.14 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.43	22.55	DELAY		-	-	-	EXPAND RING #1618
22.55	23.19	MINING		1.50	3,4,13-24	12500	COMPLETED PUSH
23.19	23.29	RING INSTALLATION	1621				
23.29	23.40	MINING		0.24	-	-	INCOMPLETE PUSH
23.40	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 22,1984
Chainage :Start 2420.85 m
End 2427.25 m
Advance for day 6.40 m

File Name: DY09-22A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	0.55	MAINTENANCE		-	-	-	GREASED T.B.M.
0.55	1.55	MINING		1.30	16	15000	COMPLETED PUSH
1.55	2.05	RING INSTALLATION	1622				
2.05	3.15	MINING		1.50	16	16000	-
3.15	3.30	RING INSTALLATION	1623				
3.30	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.10	MINING		1.50	16	16000	COMPLETED PUSH
5.10	5.25	RING INSTALLATION	1624				
5.25	6.40	MINING		1.50	16	16000	-
6.40	6.55	RING INSTALLATION	1625				
6.55	7.35	MINING		0.85	16	16000	INCOMPLETE PUSH
7.35	8.00	-- SHIFT CHANGE------		-	-	-	END OF WORK FOR DAY--WEEKEND.

Notes: SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES NUMBER OF RAMS IN USE, NOT WHICH ONES.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 24,1984 File Name: DY09-24A
Chainage :Start 2427.25 m
End 2427.95 m Project No: 831-6014
Advance for day 0.70 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK, WEEKEND					
8.00	8.20	-- SHIFT CHANGE------					
8.20	10.30	DRILLING		-	-	-	INSTRUMENTATION HOLE
10.30	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #42B,43A,15,37. PINNED RING #1624.
12.00	12.30	LUNCH					
12.30	15.20	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.
15.20	15.45	INSPECTION		-	-	-	INSPECTION OF CUTTING HEAD-LOVAT
15.45	16.20	-- SHIFT CHANGE------					
16.20	20.00	MAINTENANCE		-	-	-	ADJUST MUCK SCRAPERS ON T.B.M.
20.00	20.30	LUNCH					
20.30	23.05	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.
23.05	23.15	MAINTENANCE		-	-	-	CHECKED R.P.M. OF CUTTING HEAD
23.15	23.37	MINING		0.70	3,4,9-24	12000	COMPLETED PUSH
23.37	23.42	RING INSTALLATION	1626				
23.42	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 25,1984
Chainage :Start 2427.95 m
End 2445.91 m
Advance for day 17.96 m

File Name: DY09-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	-- SHIFT CHANGE------					
0.18	0.32	RING INSTALLATION CONT'D	1626				
0.32	1.27	MINING		1.46	3,4,12-24	12000	-
1.27	1.40	RING INSTALLATION	1627				
1.40	1.48	DELAY		-	-	-	REPAIR WATER SPRAY LINE
1.48	2.38	MINING		1.50	3,4,12-24	12500	-
2.38	2.51	RING INSTALLATION	1628				
2.51	3.32	MINING		1.50	3,4,12-24	11000	-
3.32	3.44	RING INSTALLATION	1629				
3.44	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.13	MINING		1.50	3,4,12-24	10500	COMPLETED PUSH
5.13	5.26	RING INSTALLATION	1630				
5.26	6.20	MINING		1.50	3,4,16-24	13500	-
6.20	6.33	RING INSTALLATION	1631				
6.33	7.30	MINING		1.50	3,4,17-24	11500	-
7.30	7.43	RING INSTALLATION	1632				
7.43	8.20	-- SHIFT CHANGE------					
8.20	9.15	DRILLING		-	-	-	INSTRUMENTATION HOLE
9.15	11.30	MAINTENANCE		-	-	-	CHANGED CUTTERS #43A,42B,11.
11.30	12.00	INSPECTION		-	-	-	INSPECTION OF CUTTING HEAD-LOVAT.
12.00	12.30	LUNCH					
12.30	13.50	MAINTENANCE		-	-	-	CHIPPED HOLES IN FACE TO OBTAIN MEASUREMENTS FOR STEEL FILLER PLATES.
13.50	15.40	MAINTENANCE		-	-	-	CHANGED CUTTERS AS ABOVE ASSORTED MACHINE MAINTENANCE
15.40	16.20	-- SHIFT CHANGE------					
16.20	17.00	MINING		1.50	3,4,13-24	12000	-
17.00	17.13	RING INSTALLATION	1633				
17.13	17.30	MINING		-	-	-	INCOMPLETE PUSH
17.30	17.45	DELAY		-	-	-	CHECKED WATER SPRAY IN HEAD.
17.45	18.15	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
18.15	18.30	RING INSTALLATION	1634				
18.30	19.10	MINING		1.50	3,4,13-24	12000	-
19.10	19.22	RING INSTALLATION	1635				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 25,1984
Chainage :Start 2427.95 m
End 2445.91 m
Advance for day 17.96 m

File Name: DY09-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.22	19.40	MINING		-	-	-	INCOMPLETE PUSH
19.40	20.00	DELAY		-	-	-	INSTALL MESH AND EXPAND RING.
20.00	20.30	LUNCH					
20.30	20.45	MINING		-	-	-	INCOMPLETE PUSH
20.45	20.50	DELAY		-	-	-	CECKED WATER SPRAY.
20.50	20.57	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
20.57	21.08	RING INSTALLATION	1636				
21.08	21.33	MINING		-	-	-	INCOMPLETE PUSH
21.33	22.05	DELAY		-	-	-	BELT LINE TRIPPED OFF.
22.05	22.25	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
22.25	22.37	RING INSTALLATION	1637				
22.37	23.40	MINING		1.50	3,4,13-24	12000	POWER AND SECONDARY BELT CONTINUOUSLY
23.40	24.00	-- SHIFT CHANGE------					CUTTING OUT THROUGH THE PUSH.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 26,1984
Chainage :Start 2445.91 m
End 2466.91 m
Advance for day 21.00 m

File Name: DY09-26A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	-- SHIFT CHANGE------					
0.18	0.31	RING INSTALLATION	1638				
0.31	1.21	MINING		1.50	3,4,13-24	13000	-
1.21	1.32	RING INSTALLATION	1639				
1.32	2.13	MINING		1.50	3,4,13-24	12500	-
2.13	2.24	RING INSTALLATION	1640				
2.24	3.09	MINING		1.50	3,4,11-1622-24	12900	-
3.09	3.20	RING INSTALLATION	1641				
3.20	4.05	MINING		-	-	-	INCOMPLETE PUSH
4.05	4.35	LUNCH					
4.35	4.42	MINING		-	-	-	INCOMPLETE PUSH
4.42	4.58	DELAY		-	-	-	CHUTE PLUGGED
4.58	5.04	MINING		1.50	3,4,11,13-24	10000	COMPLETED PUSH
5.04	5.19	RING INSTALLATION	1642				
5.19	6.18	MINING		1.50	3,4,13-24	11000	-
6.18	6.33	RING INSTALLATION	1643				
6.33	7.26	MINING		1.50	3,4,13-24	12000	-
7.26	7.43	RING INSTALLATION	1644				
7.43	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43B,42A,18,14. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.15	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
13.15	13.45	MINING		-	-	-	INCOMPLETE PUSH
13.45	14.00	DELAY		-	-	-	INSTALL MESH AND EXPAND RING #1643.
14.00	14.15	MINING		1.50	3,4,10,12-24	12000	COMPLETED PUSH
14.15	14.25	RING INSTALLATION	1645				
14.25	14.40	DELAY		-	-	-	SECONDARY BELT SLIPPING
14.40	15.05	MINING		-	-	-	INCOMPLETE PUSH
15.05	15.20	DELAY		-	-	-	INSTALL MESH AND EXPAND RING #1644
15.20	15.40	MINING		1.50	3,4,10,12-24	12000	COMPLETED PUSH
15.40	16.20	-- SHIFT CHANGE------					
16.20	16.35	RING INSTALLATION	1646				
16.35	17.00	MINING		-	-	-	INCOMPLETE PUSH
17.00	17.05	DELAY		-	-	-	INSTALL MESH
17.05	17.15	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 26,1984
Chainage :Start 2445.91 m
End 2466.91 m
Advance for day 21.00 m

File Name: DY09-26A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.15	17.30	DELAY		-	-	-	DUSTY- CHECKED WATER SPRAY.
17.30	17.35	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
17.35	17.53	RING INSTALLATION	1647				
17.53	18.44	MINING		1.50	3,4,13-24	8000	DROPPED PRESSURE TO REDUCE DUST
18.44	18.55	RING INSTALLATION	1648				
18.55	19.10	MAINTENANCE & DELAY		-	-	-	CLEAN AND CHECK #42B CUTTER.
19.10	19.51	MINING		1.50	3,4,13-24	8000	-
19.51	20.05	RING INSTALLATION	1649				
20.05	20.35	LUNCH					
20.35	21.30	MINING		1.50	3,4,13-24	8000	-
21.30	21.50	RING INSTALLATION	1650				
21.50	22.37	MINING		1.50	3,4,13-24	8000	-
22.37	22.54	RING INSTALLATION	1651				
22.54	23.40	MINING		1.50	3,4,13-24	8000	-
23.40	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 27,1984
Chainage :Start 2466.91 m
End 2474.81 m
Advance for day 7.90 m

File Name: DY09-27A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	-- SHIFT CHANGE------					
0.18	0.30	RING INSTALLATION	1652				
0.30	1.28	MINING		1.50	3,4,11,17-24	11000	-
1.28	1.49	RING INSTALLATION	1653				
1.49	2.42	MINING		1.50	3-8,11,12 20-24	14000	-
2.42	2.58	RING INSTALLATION	1654				
2.58	3.57	MINING		1.50	3-8,12,17	14500	-
3.57	4.13	RING INSTALLATION	1655				
4.13	4.43	LUNCH					
4.43	5.12	MINING		-	-	-	INCOMPLETE PUSH
5.12	5.25	DELAY		-	-	-	PLUGGED CHUTE
5.25	6.03	MINING		1.50	3-8,11,16, 17-20	14500	COMPLETED PUSH
6.03	6.18	RING INSTALLATION	1656				
6.18	7.17	MINING		1.50	3,4,13-24	9000	-
7.17	7.28	RING INSTALLATION	1657				
7.28	7.43	MINING		0.40	-	-	INCOMPLETE PUSH
7.43	8.20	-- SHIFT CHANGE------					
8.20	10.20	MAINTENANCE		-	-	-	CHANGED CUTTERS #43A,42B
10.20	12.00	MAINTENANCE & DELAY ?		-	-	-	DRILLING AT FACE TO EXCAVATE CHAMBER FOR WELDINGCUTTING HEAD.
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE & DELAY ?		-	-	-	CONTINUED AS ABOVE
15.40	16.00	-- SHIFT CHANGE------					
16.00	24.00	MAINTENANCE & DELAY		-	-	-	CONTINUED AS ABOVE
		-- SHIFT CHANGE------					ASSORTED MACHINE MAINTENANCE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 28,1984
Chainage :Start 2474.81 m
End 2474.81 m
Advance for day 0.00 m

File Name: DY09-28A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	MAINTENANCE & DELAY ?					DRILLED AND BLASTED CHAMBER FOR TBM.
							ASSORTED MACHINE MAINTENANCE
							BLASTED #16 MANWAY-TWICE.
							INSTALL MESH IN THE AREA OF #1650
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE & DELAY ?					ROCK BOLTED IN EXCAVATED CHAMBERS WITH 1.3 M BOLTS AND MESH.
							ASSORTED MACHINE MAINTENANCE
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
							REPAIR TBM.--6.5 HR.
		-- SHIFT CHANGE------					
16.00	24.00	MAINTENANCE & DELAY ?					WELDING CONTINUED ON TBM.
							ASSORTED MACHINE MAINTENANCE
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 29,1984 File Name: DY09-29A
Chainage :Start 2474.81 m
End 2474.81 m Project No: 831-6014
Advance for day 0.00 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	MAINTENANCE & DELAY					ASSORTED MACHINE MAINTENANCE INSTALL MESH ON THE SIDE WALL IN THE 1850-1900 M. AREA WELDING 1/2" AND 5/8" RODS ON THE CUTTER HEADS. TRAVEL--40 MIN. LUNCH--30 MIN.
8.00	16.00	NO DATA					
16.00	24.00	MAINTENANCE & DELAY -- SHIFT CHANGE------					ASSORTED MACHINE MAINTENANCE CONTINUED WELDING HEAD. TRAVEL--40 MIN. LUNCH--30 MIN.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date SEPTEMBER 30,1984
Chainage :Start 2474.81 m
End 2474.81 m
Advance for day 0.00 m

File Name: DY09-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	MAINTENANCE & DELAY					CONTINUED WELDING ON CUTTER HEADS
							ASSORTED MACHINE MAINTENANCE
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
8.00	16.00	NO DATA					
16.00	24.00	MAINTENANCE & DELAY					CONTINUED WELDING ON T.B.M.
							ASSORTED MACHINE MAINTENANCE
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 1,1984
Chainage :Start 2474.81 m
End 2474.81 m
Advance for day 0.00 m

File Name: DY10-01A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
0.00	8.00	MAINTENANCE & DELAY					CONTINUED WELDING ON T.B.M. ASSORTED MACHINE MAINTENANCE TRAVEL--40 MIN. LUNCH--30 MIN.
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE & DELAY					ASSORTED MACHINE MAINTENANCE CONTINUED WELDING ON T.B.M. TRAVEL--40 MIN. LUNCH--30 MIN.
		-- SHIFT CHANGE------					
16.00	24.00	MAINTENANCE & DELAY					CONTINUED WELDING ON T.B.M. ASSORTED MACHINE MAINTENANCE BLASTED @ 17 MANHOLE. TRAVEL--40 MIN. LUNCH--30 MIN.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 2,1984
Chainage: Start 2474.81 m
End 2474.81 m
Advance for day 0.00 m

File Name: DY10-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	MAINTENANCE & DELAY					CONTINUED WELDING PLATES ON T.B.M.
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE & DELAY					CONTINUED WELDING ON T.B.M
							ASSORTED MACHINE MAINTENANCE
							DRILLED OFF #20 MANWAY.
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
		-- SHIFT CHANGE------					
16.00	24.00	MAINTENANCE & DELAY					CONTINUED WELDING ON T.B.M.
							BLASTED #18 MANHOLE.
							ASSORTED MACHINE MAINTENANCE
							TRAVEL--40 MIN.
							LUNCH--30 MIN.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 3,1984
Chainage :Start 2474.81 m
End 2485.63 m
Advance for day 10.82 m

File Name: DY10-03A

Project No: 831-6014

Time (hours)		Activity	Ring	Advance	Push Cylinder		Comments
Start	End		No.	(m)	In use	Pressure (kPa)	
0.00	8.00	MAINTENANCE & DELAY					CONTINUED WELDING ON T.B.M.--COMPLETED- BLAST MANWAY #19,DRILLED OFF MANWAY #22
8.00	8.20	-- SHIFT CHANGE------					
8.20	12.00	DRILLING-DELAY					SET UP AND DRILL STRATA CONTROL HOLE MANWAY WORK. RE-INSTALL SCRAPERS AND PLATES
12.00	12.30	LUNCH					
12.30	13.56	DRILLING-DELAY					COMPLETED STRATA CONTROL HOLE. SET UP FOR MINING
13.56	14.23	MINING		1.02	3,4,13-24	15000	? ?
14.23	14.41	DELAY		-	-	-	INST'D SPACERS & EXPAND RING #1656.
14.41	14.56	MINING		-	-	-	COMPLETED PUSH
14.56	15.28	RING INSTALLATION & DELAY	1658				LONGER RING INST'LN DUE TO WATER IN THE INVERT FROM BROKEN DISCHARGE HOSE.
15.28	15.41	MINING		-	3,4,9,11,13-20	11000	INCOMPLETE PUSH
15.41	16.00	DELAY		-	-	-	INSTALL MESH
16.00	16.16	MINING		0.80	3,4,9,11,13-20	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					16.16..16.31-TRAVEL UP. 16.00..16.15-TRAVEL DOWN.
16.15	16.35	MINING		0.70	3,4,13-24	13000	COMPLETED PUSH
16.35	16.45	RING INSTALLATION	1659				
16.45	17.30	MINING		1.50	3,4,11-24	13000	-
17.30	17.40	RING INSTALLATION	1660				
17.40	18.55	DELAY		-	-	-	#1 MAIN CONVEYOR TRIPPED OUT.
18.55	19.45	MINING		1.50	3-8,11-24	13000	-
19.45	20.00	RING INSTALLATION	1661				
20.00	20.30	LUNCH					
20.30	21.00	MINING		-	-	-	INCOMPLETE PUSH
21.00	21.15	DELAY		-	-	-	INSTALL MESH AND LAGGING
21.15	21.30	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
21.30	21.45	RING INSTALLATION	1662				
21.45	22.30	MINING		1.50	3,4,11-24	12000	-
22.30	22.45	RING INSTALLATION	1663				
22.45	23.33	MINING		1.50	3,4,11-24	12000	-
23.33	23.45	RING INSTALLATION	1664				

Notes:

Dorbin-Norien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date OCTOBER 3,1984
Chainage :Start 2474.81 m
End 2485.63 m
Advance for day 10.82 m

File Name: DY10-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.45	24.15	MINING -- SHIFT CHANGE------		0.80	3,4,11-24	12000	INCOMPLETE PUSH 24.15..24.30-TRAVEL UP.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 4,1984
Chainage :Start 2485.63 m
End 2507.08 m
Advance for day 21.45 m

File Name: DY10-04A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	-- SHIFT CHANGE------					
0.15	0.40	MINING		0.70	-	-	COMPLETED PUSH
0.40	0.50	RING INSTALLATION	1665				
0.50	1.45	MINING		1.51	-	-	-
1.45	1.54	RING INSTALLATION	1666				
1.54	2.26	MINING		-	-	-	INCOMPLETE PUSH
2.26	2.31	DELAY		-	-	-	EXPAND RING
2.31	2.49	MINING		1.51	-	-	COMPLETED PUSH
2.49	3.00	RING INSTALLATION	1667				
3.00	3.27	MINING		-	-	-	INCOMPLETE PUSH
3.27	3.31	DELAY		-	-	-	EXPAND RING
3.31	3.53	MINING		1.51	-	-	COMPLETED PUSH
3.53	4.02	RING INSTALLATION	1668				
4.02	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.11	MINING		-	-	-	INCOMPLETE PUSH
5.11	5.15	DELAY		-	-	-	EXPAND RING
5.15	5.30	MINING		1.51	-	-	COMPLETED PUSH
5.30	5.39	RING INSTALLATION	1669				
5.39	6.07	MINING		-	-	-	INCOMPLETE PUSH
6.07	6.11	DELAY		-	-	-	EXPAND RING
6.11	6.12	MINING		-	-	-	INCOMPLETE PUSH
6.12	6.27	DELAY		-	-	-	BELT STOPPED
6.27	6.45	MINING		1.51	-	-	COMPLETED PUSH
6.45	7.05	RING INSTALLATION	1670				
7.05	7.30	MINING		-	-	-	INCOMPLETE PUSH
7.30	7.35	DELAY		-	-	-	EXPAND RING
7.35	8.03	MINING		1.50	-	-	COMPLETED PUSH
8.03	8.16	RING INSTALLATION	1671				
		-- SHIFT CHANGE------					8.16..8.31-TRAVEL UP.
							8.00..8.16-TRAVEL DOWN.
8.16	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							PINNED RING #1669 WITH 4 SETS OF PINS
							CHANGED CUTTERS #43B,42A,32,27,30,19.
12.00	12.30	LUNCH					
12.30	13.40	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 4,1984
Chainage :Start 2485.63 m
End 2507.08 m
Advance for day 21.45 m

File Name: DY10-04A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
13.40	13.47	MINING		-	-	-	INCOMPLETE PUSH
13.47	15.58	DELAY		-	-	-	ELECTICAL PROBLEMS -#3 MAIN CONVEYOR.
15.58	16.18	MINING		0.80	3,4,11-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					16.18..16.31-TRAVEL UP.
							16.00..16.18-TRAVEL DOWN.
16.18	16.35	MINING		0.70	3,4,11-24	10000	COMPLETED PUSH
16.35	16.45	RING INSTALLATION	1672				
16.45	17.00	DELAY		-	-	-	#2 MAIN CONVEYOR SLIPPING
17.00	17.45	MINING		1.50	3,4,12-24	12000	-
17.45	17.55	RING INSTALLATION	1673				
17.55	18.40	MINING		1.50	3,4,12-24	12000	-
18.40	18.50	RING INSTALLATION	1674				
18.50	19.25	MINING		-	-	-	INCOMPLETE PUSH
19.25	19.40	DELAY		-	-	-	POWER KICKED OFF OUTSTATION T.B.M.
19.40	19.50	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
19.50	20.00	RING INSTALLATION	1675				
20.00	20.20	MINING		-	-	-	INCOMPLETE PUSH
20.20	20.50	LUNCH					
20.50	21.20	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
21.20	21.35	RING INSTALLATION	1676				
21.35	22.23	MINING		1.50	3,4,11-24	12000	-
22.23	22.35	RING INSTALLATION	1677				
22.35	23.20	MINING		1.50	3,4,12-24	12000	-
23.20	23.35	RING INSTALLATION	1678				
23.35	24.26	MINING		1.20	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------					24.16..24.3-TRAVEL UP

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 5,1984 File Name: DY10-05A
Chainage :Start 2507.08 m
End 2529.68 m Project No: 831-6014
Advance for day 22.60 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	0.20	MINING		0.30	-	15500	COMPLETED PUSH
0.20	0.31	RING INSTALLATION	1679				
0.31	1.00	MINING		-	-	15500	INCOMPLETE PUSH
1.00	1.05	DELAY		-	-	-	EXPAND RING
1.05	1.30	MINING		1.50	-	1550	COMPLETED PUSH
1.30	1.40	RING INSTALLATION	1680				
1.40	1.55	MINING		-	-	14500	INCOMPLETE PUSH
1.55	2.05	DELAY		-	-	-	SCRUBER DOWN
2.05	2.10	MINING		-	-	14500	INCOMPLETE PUSH
2.10	2.15	DELAY		-	-	-	EXPAND RING
2.15	2.43	MINING		1.50	-	14500	COMPLETED PUSH
2.43	2.55	RING INSTALLATION	1681				
2.55	3.25	MINING		-	-	14500	INCOMPLETE PUSH
3.25	3.30	DELAY		-	-	-	EXPAND RING
3.30	3.45	MINING		1.50	-	14500	COMPLETED PUSH
3.45	4.00	RING INSTALLATION	1682				
4.00	4.20	MINING		-	-	14500	INCOMPLETE PUSH
4.20	4.50	LUNCH					
4.50	4.55	DELAY		-	-	-	EXPAND RING
4.55	5.20	DELAY		-	-	-	BELT SLIPPING
5.20	5.30	MINING		-	-	14500	INCOMPLETE PUSH
5.30	5.50	DELAY		-	-	-	BELT SLIPPING
5.50	6.05	MINING		1.50	-	14500	COMPLETED PUSH
6.05	6.20	RING INSTALLATION	1683				
6.20	6.45	MINING		-	-	14500	INCOMPLETE PUSH
6.45	6.50	DELAY		-	-	-	EXPANDING RING
6.50	7.00	MINING		-	-	14500	INCOMPLETE PUSH
7.00	7.20	DELAY		-	-	-	BELT SLIPPING
7.20	7.25	MINING		1.50	-	14500	COMPLETED PUSH
7.25	7.35	RING INSTALLATION	1684				
7.35	8.00	MINING		-	-	13000	INCOMPLETE PUSH
8.00	8.05	DELAY		-	-	-	EXPAND RING
8.05	8.16	MINING		1.20	-	13000	INCOMPLETE PUSH
							8.16..?-TRAVEL UP.
		-- SHIFT CHANGE------					8.00..8.16-TRAVEL DOWN

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 5,1984
Chainage: Start 2507.08 m
End 2529.68 m
Advance for day 22.60 m

File Name: DY10-05A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.16	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE CHANGED CUTTERS #42A,42,20,31.
12.00	12.30	LUNCH					
12.30	14.06	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
14.06	14.18	MINING		0.30	-	12000	COMPLETED PUSH
14.18	14.30	RING INSTALLATION	1685				
14.30	15.16	MINING		1.50	3,4,11-1620-24	12500	-
15.16	15.28	RING INSTALLATION	1686				
15.28	15.35	MINING		-	-	-	INCOMPLETE PUSH
15.35	15.47	DELAY		-	-	-	LOST POWER TO THE T.B.M.
15.47	16.16	MINING		1.20	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------					16.16..?-TRAVEL UP. 16.00..16.16-TRAVEL DOWN.
16.16	16.25	MINING		0.30	3,4,11-24	12000	COMPLETED PUSH
16.25	16.40	RING INSTALLATION	1687				
16.40	17.25	MINING		1.50	3,4,11-24	12000	-
17.25	17.38	RING INSTALLATION	1688				
17.38	18.30	MINING		1.50	3,4,12-24	12000	-
18.30	18.42	RING INSTALLATION	1689				
18.42	19.37	MINING		1.50	3,4,12-24	12000	-
19.37	19.50	RING INSTALLATION	1690				
19.50	20.15	MINING		-	-	-	INCOMPLETE PUSH
20.15	20.45	LUNCH					
20.45	21.20	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
21.20	21.30	RING INSTALLATION	1691				
21.30	22.25	MINING		1.50	3,4,12-24	12000	-
22.25	22.38	RING INSTALLATION	1692				
22.38	23.30	MINING		1.50	3,4,12-24	12000	-
23.30	23.40	RING INSTALLATION	1693				
23.40	24.00	MINING		0.72	-	-	INCOMPLETE PUSH
24.00	24.16	MINING		0.58	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------			.		24.16..?-TRAVEL UP

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 6,1984
Chainage :Start * 2531.18 m
End 2538.58 m
Advance for day 7.40 m

File Name: DY10-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					PREVIOUS SHIFT CONTINUING TO MINE.
0.16	0.20	MINING		0.20	16	8300	COMPLETED PUSH
0.20	0.30	RING INSTALLATION	1694				
0.30	1.15	MINING		1.50	16	9700	-
1.15	1.30	RING INSTALLATION	1695				
1.30	1.35	DELAY					EXPAND RING
1.35	2.20	MINING		1.50	16	11800	-
2.20	2.30	RING INSTALLATION	1696				
2.30	3.20	MINING		1.50	16	16600	-
3.20	3.25	MAINTENANCE		-	-	-	CHECK CUTTERS
3.25	3.30	DELAY					EXPAND RING
3.30	3.45	RING INSTALLATION	1697				
3.45	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.10	MINING		1.50	16	16600	COMPLETED PUSH
5.10	5.20	DELAY					POWER LOSS ON PRIMARY BELT
5.20	5.25	DELAY					
5.25	5.40	RING INSTALLATION	1698				
5.40	6.30	MINING		1.50	12	13800	-
6.30	6.35	DELAY					EXPAND RING
6.35	6.50	RING INSTALLATION	1699				
6.50	7.35	MINING		1.20	16	11000	INCOMPLETE PUSH
7.35	8.00	-- SHIFT CHANGE------					END OF DAY'S WORK(THANKSGIVING WEEKEND)

Notes: *DIFFERENCES BETWEEN OCT.5 END CHAINAGE AND OCT.6 START CHAINAGE UNACCOUNTED FOR.
SINGLE NUMBER IN THE "IN USE" COLUMN DENOTES NUMBER OF RAM IN USE, NOT WHICH ONE

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 09,1984
Chainage :Start 2538.58 m
End 2550.78 m
Advance for day 12.20 m

File Name: DY10-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					THANKSGIVING WEEKEND
8.00	8.20	-- SHIFT CHANGE------					
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #6,16,42B,43A.
							PINNED RING #1698 WITH 4 SETS OF PINS
12.00	12.30	LUNCH					
12.30	13.30	MAINTENANCE		-	-	-	END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
13.30	14.15	DELAY		-	-	-	REPAIR T.B.M. WATER PUMP
14.15	14.25	DELAY					PULL PRIMARY CONVEYOR IN
14.25	14.36	MINING		0.30	3-8,13-24	12000	COMPLETED PUSH
14.36	14.49	RING INSTALLATION	1700				
14.49	15.37	MINING		1.50	3-8,13-24	10000	-
15.37	15.49	RING INSTALLATION	1701				
15.49	16.00	MINING		0.20	3-8,13-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.27	MINING		-	-	-	INCOMPLETE PUSH
16.27	16.31	DELAY					INSTALL SPACERS & EXPAND RING
16.31	16.41	MINING		1.10	3-8,13-24	10000	COMPLETED PUSH
16.41	16.54	RING INSTALLATION	1702				
16.54	17.26	MINING		-	-	-	INCOMPLETE PUSH
17.26	17.30	DELAY					INSTALL SPACERS & EXPAND RING
17.30	17.51	MINING		1.50	3,4,11-24	10500	COMPLETED PUSH
17.51	18.05	RING INSTALLATION	1703				
18.05	18.35	MINING		-	-	-	INCOMPLETE PUSH
18.35	18.38	DELAY					INSTALL SPACERS & EXPAND RING
18.38	18.58	MINING		1.50	3,4,12-24	10500	COMPLETED PUSH
18.58	19.10	RING INSTALLATION	1704				
19.10	19.36	MINING		-	-	-	INCOMPLETE PUSH
19.36	19.39	DELAY					INSTALL SPACERS & EXPAND RING
19.39	19.58	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
19.58	20.11	RING INSTALLATION	1705				
20.11	20.25	MINING		-	-	-	INCOMPLETE PUSH
20.25	20.55	LUNCH					
20.55	21.15	MINING		-	-	-	INCOMPLETE PUSH
21.15	21.19	DELAY					INSTALL SPACERS & EXPAND RING
21.19	21.28	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 09,1984 — File Name: DY10-09A
Chainage :Start 2538.58 m
End 2550.78 m — Project No: 831-6014
Advance for day 12.20 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.28	21.44	DELAY					LOSS OF POWER TO T.B.M.
21.44	21.56	MINING		1.50	3,4,12-24	11500	COMPLETED PUSH
21.56	22.07	RING INSTALLATION	1706				
22.07	22.36	MINING		-	-	-	INCOMPLETE PUSH
22.36	22.40	DELAY					INSTALL SPACERS & EXPAND RING
22.40	23.00	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
23.00	23.12	RING INSTALLATION	1707				
23.12	23.43	MINING		-	-	-	INCOMPLETE PUSH
23.43	23.47	DELAY					INSTALL SPACERS & EXPAND RING
23.47	24.00	MINING		1.40	3,4,12-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 10,1984
Chainage: Start 2550.78 m
End 2571.98 m
Advance for day 21.20 m

File Name: DY10-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.06	MINING		0.10	3,4,12-24	10000	COMPLETED PUSH
0.06	0.20	RING INSTALLATION	1708				
0.20	1.08	MINING		1.50	3,4,11-24	10000	-
1.08	1.20	RING INSTALLATION	1709				
1.20	2.10	MINING		1.50	3,4,12-24	10000	-
2.10	2.20	RING INSTALLATION	1710				
2.20	2.35	DELAY					NO WATER TO T.B.M. (PRIME PUMP)
2.35	3.25	MINING		1.50	3,4,11-24	10000	-
3.25	3.38	RING INSTALLATION	1711				
3.38	3.50	MINING		-	-	-	INCOMPLETE PUSH
3.50	4.00	DELAY					INSTALL MESH & LAGGING
4.00	4.30	LUNCH					
4.30	4.45	MINING		-	-	-	INCOMPLETE PUSH
4.45	4.50	DELAY					EXPAND RING #1710
4.50	5.00	DELAY					ADJUST PRIMARY BELT TENSION
5.00	5.20	MINING		1.50	3,4,12-24	10000	COMPLETED PUSH
5.20	5.33	RING INSTALLATION	1712				
5.33	6.10	MINING		-	-	-	INCOMPLETE PUSH
6.10	6.15	DELAY					EXPAND RING #1711
6.15	6.30	MINING		1.50	3,4,11-24	10000	COMPLETED PUSH
6.30	6.45	RING INSTALLATION	1713				
6.45	7.20	MINING		-	-	-	INCOMPLETE PUSH
7.20	7.30	DELAY					MEASURE TAILSKIN(SPECIAL SET OF THRUST
7.30	7.45	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH BEAMS)
7.45	8.00	RING INSTALLATION	1714				
		-- SHIFT CHANGE------					
8.00	8.16	MINING		-	-	-	INCOMPLETE PUSH
8.16	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #8,37,42A,43B.
							PINNED RING #1712 WITH 4 SETS OF PINS
12.00	12.30	LUNCH					
12.30	13.20	MAINTENANCE		-	-	-	END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
13.20	13.50	MINING		1.50	3-8,10,12,14, 16,21-24	15000	COMPLETED PUSH
13.50	14.04	RING INSTALLATION	1715				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 10,1984
Chainage :Start 2550.78 m
End 2571.98 m
Advance for day 21.20 m

File Name: DY10-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
14.04	14.55	MINING		1.40	3-8,10,12,14, 16,21-24	15000	-
14.55	15.35	DELAY					BELTING DOWN(ADJUST NO.2 O/H BELT)
15.35	15.50	RING INSTALLATION	1716				SPECIAL SET
15.50	16.00	MINING		0.10	3-8,10,12,14, 16,21-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.23	MINING		-	-	-	INCOMPLETE PUSH
16.23	16.36	DELAY					INSTALL SPACERS & EXPAND RING(RING IS
16.36	17.00	MINING		1.30	3,4,12,14,16, 17-24	10500	COMPLETED PUSH ROTATING)
17.00	17.15	RING INSTALLATION	1717				
17.15	17.32	MINING		-	-	-	INCOMPLETE PUSH
17.32	17.43	DELAY					INSTALL SPACERS & EXPAND RING
17.43	18.20	MINING		1.50	3-8,12-24	10000	COMPLETED PUSH
18.20	18.31	RING INSTALLATION	1718				
18.31	18.57	MINING		-	-	-	INCOMPLETE PUSH
18.57	19.04	DELAY					INSTALL SPACERS & EXPAND RING
19.04	19.07	MINING		-	-	-	INCOMPLETE PUSH
19.07	19.11	DELAY					SCRUBBER FLOW "RED LIGHT" IS ON
19.11	19.30	MINING		1.50	3-8,12-24	10000	COMPLETED PUSH
19.30	19.47	RING INSTALLATION	1719				
19.47	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.52	MINING		-	-	-	INCOMPLETE PUSH
20.52	20.56	DELAY					INSTALL SPACERS & EXPAND RING
20.56	21.18	MINING		1.50	3,4,12-24	11500	COMPLETED PUSH
21.18	21.32	RING INSTALLATION	1720				
21.32	22.01	MINING		-	-	-	INCOMPLETE PUSH
22.01	22.03	DELAY					INSTALL SPACERS & EXPAND RING
22.03	22.08	MINING		-	-	-	INCOMPLETE PUSH
22.08	22.23	DELAY					PLUGGED CHUTE (CLEAN UP SPILLAGE)
22.23	22.34	MINING		1.50	3,4,12-24	11500	COMPLETED PUSH
22.34	22.48	RING INSTALLATION	1721				
22.48	23.17	MINING		-	-	-	INCOMPLETE PUSH
23.17	23.20	DELAY					INSTALL SPACERS & EXPAND RING

Notes:

Donkin-Morien Developeent Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 10,1984
Chainage :Start 2550.78 m
End 2571.98 m
Advance for day 21.20 m

File Name: DY10-10A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
23.20	23.38	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
23.38	23.50	RING INSTALLATION	1722				
23.50	24.00	MINING		0.30	3,4,17-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 11,1984
Chainage: Start 2571.98 m
End 2596.28 m
Advance for day 24.30 m

File Name: DY10-11A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.37	MINING		1.20	3-8,16-24	14000	COMPLETED PUSH
0.37	0.50	RING INSTALLATION	1723				
0.50	1.40	MINING		1.50	3-8,13-24	12000	-
1.40	1.52	RING INSTALLATION	1724				
1.52	2.35	MINING		1.50	3-8,13-24	12000	-
2.35	2.45	RING INSTALLATION	1725				
2.45	3.35	MINING		1.50	3,4,13-24	12000	-
3.35	3.47	RING INSTALLATION	1726				
3.47	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	5.10	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
5.10	5.22	RING INSTALLATION	1727				
5.22	6.10	MINING		1.50	3-8,13-24	12000	-
6.10	6.23	RING INSTALLATION	1728				
6.23	7.12	MINING		1.50	3-8,13-24	12000	-
7.12	7.24	RING INSTALLATION	1729				
7.24	8.00	MINING		1.20	3-8,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.16	MINING		0.30	3-8,13-1621-24	12000	COMPLETED PUSH
8.16	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #42B,43A,30,28. PINNED RING #1729 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.45	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.
13.45	14.00	RING INSTALLATION	1730				
14.00	14.45	MINING		1.50	3-8,13-1621-24	12000	-
14.45	15.00	RING INSTALLATION	1731				
15.00	15.50	MINING		1.50	3-8,13-1621-24	12000	-
15.50	16.00	RING INSTALLATION	1732				
		-- SHIFT CHANGE------					
16.00	16.10	DELAY		-	-	-	SECONDARY CONVEYOR DOWN.
16.10	16.34	MINING		-	-	-	INCOMPLETE PUSH
16.34	16.37	DELAY		-	-	-	INST'D SPACERS AND EXPAND RING
16.37	17.04	MINING		1.50	3,4,8,11-16 22-24	13500	-
17.04	17.19	RING INSTALLATION	1733				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 11,1984
Chainage: Start 2571.98 m
End 2596.28 m
Advance for day 24.30 m

File Name: DY10-11A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.19	17.33	DELAY		-	-	-	REMOVED SCREENS FROM CHUTE.
17.33	18.04	MINING		-	-	-	INCOMPLETE PUSH
18.04	18.08	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING.
18.08	18.31	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
18.31	18.42	RING INSTALLATION	1734				
18.42	19.08	MINING		-	-	-	INCOMPLETE PUSH
19.08	19.12	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING.
19.12	19.32	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
19.32	19.42	RING INSTALLATION	1735				
19.42	20.13	MINING		-	-	-	INCOMPLETE PUSH
20.13	20.19	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING.
20.19	20.25	MINING		-	-	-	INCOMPLETE PUSH
20.25	20.55	LUNCH					
20.55	21.12	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
21.12	21.23	RING INSTALLATION	1736				
21.23	21.54	MINING		-	-	-	INCOMPLETE PUSH
21.54	21.58	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING
21.58	22.17	MINING		1.50	3,4,12-24	12500	COMPLETED PUSH
22.17	22.33	RING INSTALLATION	1737				
22.33	23.05	MINING		-	-	-	INCOMPLETE PUSH
23.05	23.09	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING.
23.09	23.31	MINING		1.50	3-8,12-24	11500	COMPLETED PUSH
23.31	23.43	RING INSTALLATION	1738				
23.43	24.00	MINING		0.50	3-8,13-24	13500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 12,1984 File Name: DY10-12A
Chainage :Start 2596.28 m
End 2615.98 m Project No: 831-6014
Advance for day 19.70 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.46	MINING		1.00	3-8,12-24	12000	COMPLETED PUSH
0.46	0.52	RING INSTALLATION	1739				
0.52	1.50	MINING		1.50	3-8,12-24	12000	-
1.50	2.03	RING INSTALLATION	1740				
2.03	2.55	MINING		1.50	3-8,12-24	12000	-
2.55	3.07	RING INSTALLATION	1741				
3.07	4.00	MINING		1.50	3-8,12-24	12000	-
4.00	4.15	RING INSTALLATION	1742				
4.15	4.45	LUNCH					
4.45	5.40	MINING		1.50	3-8,12-24	12000	-
5.40	5.53	RING INSTALLATION	1743				
5.53	6.30	MINING		1.15	3-8,12-24	12000	INCOMPLETE PUSH
6.30	8.00	MAINTENANCE & DELAY		-	-	-	ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
8.00	8.16	MAINTENANCE		-	-	-	REPAIR BROKE HOSE ON T.B.M.
8.16	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #42A,43B,5-7,15,(1,2,3, PINNED RING #1741 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
14.00	14.15	MINING		0.35	3-8,13-1621-24	15000	COMPLETED PUSH
14.15	14.30	RING INSTALLATION	1744				
14.30	15.28	MINING		1.50	3-8,13-1621-24	14000	-
15.28	15.38	RING INSTALLATION	1745				
15.38	16.00	MINING		0.55	3-8,13-1621-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.34	MINING		0.95	3,4,6,8,11-17, 20-24	11000	COMPLETED PUSH
16.34	16.47	RING INSTALLATION	1746				
16.47	17.14	MINING		-	-	-	INCOMPLETE PUSH
17.14	17.17	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING
17.17	17.50	MINING		1.50	3,4,13-24	13500	COMPLETED PUSH
17.50	18.02	RING INSTALLATION	1747				
18.02	18.34	MINING		-	-	-	INCOMPLETE PUSH
18.34	18.37	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING
18.37	19.05	MINING		1.50	3,4,11-24	11500	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 12,1984
Chainage: Start 2596.28 m
End 2615.98 m
Advance for day 19.70 m

File Name: DY10-12A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.05	19.17	RING INSTALLATION	1748				
19.17	19.42	MINING		-	-	-	INCOMPLETE PUSH
19.42	19.46	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING
19.46	20.20	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
20.20	20.33	RING INSTALLATION	1749				
20.33	20.40	MINING		-	-	-	INCOMPLETE PUSH
20.40	21.10	LUNCH					
21.10	21.39	MINING		-	-	-	INCOMPLETE PUSH
21.39	21.42	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING
21.42	22.02	MINING		1.50	3-8,12-24	9000	COMPLETED PUSH
22.02	22.15	RING INSTALLATION	1750				
22.15	22.43	MINING		-	-	-	INCOMPLETE PUSH
22.43	22.47	DELAY		-	-	-	INST'D SPACERS AND EXPANDED RING
22.47	23.12	MINING		1.50	3-8,12-24	9000	COMPLETED PUSH
23.12	23.25	RING INSTALLATION	1751				
23.25	24.00	MINING		0.70	3-8,12-24	8500	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 13,1984 — File Name: DY10-13A
Chainage :Start 2615.98 m
End 2620.78 m — Project No: 831-6014
Advance for day 4.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.35	MINING		-	-	-	INCOMPLETE PUSH
0.35	1.20	MAINTENANCE		-	-	-	REPLACE BROKEN HYDRAULIC HOSE
1.20	2.35	DELAY		-	-	-	WAITED FOR OIL FROM SURFACE & PRESSURE TO BUILD UP.
2.35	2.50	MINING		0.80	3-8,12-24	6000	COMPLETED PUSH
2.50	3.00	RING INSTALLATION	1752				
3.00	4.25	MINING		1.50	3-8,12-24	6000	-
4.25	4.55	RING INSTALLATION	1753				REPLACED THRUST BEAMS BTWN 1751-1752 WEST SIDE
4.55	5.55	MINING		1.50	3-8,12-24	8000	-
5.55	6.05	RING INSTALLATION	1754				
6.05	7.15	MINING		1.10	3-8,12-24	6000	INCOMPLETE PUSH
7.15	7.30	DELAY		-	-	-	CHECKED CUTTERS
7.30	8.00	MAINTENANCE		-	-	-	GENERAL CLEAN UP IN PREPARATION TO DRILL.
		-- SHIFT CHANGE------					END OF WORK FOR DAY-WEEKEND-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 15,1984
Chainage: Start 2620.78 m
End 2621.18 m
Advance for day 0.40 m

File Name: DY10-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO ACTIVITY					
8.00	8.16	-- SHIFT CHANGE------					
8.16	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43A,42B,17,41. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.35	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.
15.35	15.50	MINING		0.40	3-8,12-24	10000	COMPLETED PUSH
15.50	16.00	RING INSTALLATION	1755				
		-- SHIFT CHANGE------					
16.00	17.00	MINING		1.50	3,4,13-24	12-15000	-
17.00	17.10	RING INSTALLATION	1756				
17.10	18.18	DELAY		-	-	-	ELECTRICAL CABLE SEVERED UNDER SKID.
18.18	20.00	DELAY		-	-	-	ATTEMPT TO FREE T.B.M.
20.00	20.30	LUNCH					
20.30	22.30	DELAY		-	-	-	ATTEMPT TO FREE T.B.M.
22.30	23.45	MAINTENANCE		-	-	-	REPLACE 3 SETS OF #9 & #10 THRUST BEAMS; PINNED RING #1754
23.45	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 16,1984
Chainage :Start 2622.68 m
End 2641.98 m
Advance for day 19.30 m

File Name: DY10-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.20	-- SHIFT CHANGE------					
0.20	3.38	MINING		1.50	3-8,12-24	11250	EXCAVATION VERY SLOW UNTIL 3.00 WHEN HEAD APPEARED TO FREE ITSELF
3.38	3.53	RING INSTALLATION	1757				
3.53	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.28	MINING		1.50	3-8,12-24	13500	COMPLETED PUSH
5.28	5.48	RING INSTALLATION	1758				
5.48	6.52	MINING		1.50	3,4,6,8,11-16, 20-24	13500	-
6.52	7.06	RING INSTALLATION	1759				
7.06	8.00	MINING		1.30	3-8,12-24	13500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.10	MINING		0.20	3-8,12-24	13000	COMPLETED PUSH
8.10	8.30	RING INSTALLATION	1760				
8.30	9.00	MINING		-	-	-	INCOMPLETE PUSH
9.00	9.10	DELAY		-	-	-	INSTALL MESH AND EXPAND RING #1759.
9.10	9.40	MINING		1.50	3-8,12-24	13000	COMPLETED PUSH
9.40	9.55	RING INSTALLATION	1761				
9.55	10.25	MINING		-	-	-	INCOMPLETE PUSH
10.25	10.40	DELAY		-	-	-	EXPANDED RING #1760, TOOK MEASUREMENTS FOR SPECIAL THRUST BEAMS.
10.40	11.15	MINING		1.50	3-8,12-24	13000	COMPLETED PUSH
11.15	11.30	RING INSTALLATION	1762				
11.30	11.45	MINING		0.30	3-8,12-24	13000	INCOMPLETE PUSH
11.45	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #34,38,42A,43B,36. PINNED RING #1761 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	16.10	DELAY		-	-	-	START UP BELTING
16.10	16.32	MINING		-	-	-	INCOMPLETE PUSH
16.32	16.37	DELAY		-	-	-	EXPAND ARCH #1761
16.37	16.55	MINING		1.20	3-8,17-24	16000	COMPLETED PUSH
16.55	17.10	RING INSTALLATION	1763				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 16,1984
Chainage :Start 2622.68 m
End 2641.98 m
Advance for day 19.30 m

File Name: DY10-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.10	18.05	MINING		1.50	3-8,17-24	11000	-
18.05	18.22	RING INSTALLATION	1764	-	-	-	SPECIAL SET
18.22	19.27	MINING		1.50	3-8,10,12,14, 17-24	11000	-
19.27	19.42	RING INSTALLATION	1765				
19.42	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.00	MINING		1.50	3-8,10,12,14, 17-24	11000	COMPLETED PUSH
21.00	21.17	RING INSTALLATION	1766				
21.17	22.05	MINING		1.50	3-8,10,12,14 17-24	11000	-
22.05	22.15	RING INSTALLATION	1767				
22.15	23.00	MINING		1.50	3-8,10,12,14, 17-24	11000	-
23.00	23.14	RING INSTALLATION	1768				
23.14	23.55	MINING		1.30	3-8,10,12,14, 17-24	11000	INCOMPLETE PUSH
23.55	24.00	DELAY		-	-	-	BELTS SLIPPING
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 17,1984
Chainage: Start 2641.98 m
End 2661.38 m
Advance for day 19.40 m

File Name: DY10-17A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.08	MINING		0.20	-	-	COMPLETED PUSH
0.08	0.23	RING INSTALLATION	1769				
0.23	1.14	MINING		1.50	3-8,12-16,18, 20-24	10500	-
1.14	1.26	RING INSTALLATION	1770				
1.26	2.20	MINING		1.50	3-8,12-16,18, 20-24	11500	-
2.20	2.34	RING INSTALLATION	1771				
2.34	3.29	MINING		1.50	3-8,12-1620-24	12000	-
3.29	3.43	RING INSTALLATION	1772				
3.43	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	4.53	DELAY		-	-	-	TROUBLE STARTING T.B.M.
4.53	5.18	MINING		1.50	3-8,12-1620-24	12000	COMPLETED PUSH
5.18	5.32	RING INSTALLATION	1773				
5.32	6.29	MINING		1.50	3-8,13-24	10500	-
6.29	6.44	RING INSTALLATION	1774				
6.44	7.39	MINING		1.50	3,4,11-24	14500	-
7.39	7.53	RING INSTALLATION	1775				
7.53	8.00	MINING		0.20	3,4,13-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.20	MINING		0.40	3,4,12-24	16000	INCOMPLETE PUSH
8.20	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43A,42B,22,21,23,35, ASSORTED MACHINE MAINTENANC. 40,25. PINNED RING #1773 WITH 2 SETS OF PINS
12.00	12.30	LUNCH					
12.30	16.00	MAINTENANCE		-	-	-	CONTINUED AS ABOVE.
		-- SHIFT CHANGE------					
16.00	16.18	DELAY		-	-	-	START UP BELT LINE.
16.18	16.53	MINING		0.90	3,4,16-24	15000	COMPLETED PUSH
16.53	17.05	RING INSTALLATION	1776				
17.05	17.56	MINING		1.50	3,4,16-24	15000	-
17.56	18.10	RING INSTALLATION	1777				
18.10	18.25	MINING		-	-	-	INCOMPLETE PUSH
18.25	18.40	DELAY		-	-	-	INSTALL MESH
18.40	19.13	MINING		1.50	3,4,16-24	12000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 17,1984
Chainage: Start 2641.98 m
End 2661.38 m
Advance for day 19.40 m

File Name: DY10-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.13	19.25	RING INSTALLATION	1778				
19.25	19.57	MINING		-	-	-	INCOMPLETE PUSH
19.57	20.05	DELAY		-	-	-	INSTALL MESH
20.05	20.35	LUNCH					
20.35	21.07	MINING		1.50	3,4,16-24	12000	COMPLETED PUSH
21.07	21.19	RING INSTALLATION	1779				
21.19	21.40	MINING		-	-	-	INCOMPLETE PUSH
21.40	21.45	DELAY		-	-	-	INSTALL MESH
21.45	22.10	MINING		1.50	3,4,16-24	12000	COMPLETED PUSH
22.10	22.25	RING INSTALLATION	1780				
22.25	23.10	MINING		1.50	3,4,16-24	12000	-
23.10	23.23	RING INSTALLATION	1781				
23.23	24.00	MINING		1.20	3,4,16-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 18,1984
Chainage: Start 2661.38 m
End 2684.88 m
Advance for day 23.50 m

File Name: DY10-18A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	MINING		0.30	-	-	COMPLETED PUSH
0.15	0.28	RING INSTALLATION	1782				
0.28	0.40	DELAY		-	-	-	REPAIRED OIL LEAK
0.40	1.31	MINING		1.50	-	13000	-
1.31	1.44	RING INSTALLATION	1783				
1.44	2.29	MINING		1.50	3-8,13-1620-24	12500	-
2.29	2.41	RING INSTALLATION	1784				
2.41	3.31	MINING		1.50	3-8,13-1620-24	13500	-
3.31	3.45	RING INSTALLATION	1785				
3.45	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	5.13	MINING		1.50	3-8,13-1620-24	13000	COMPLETED PUSH
5.13	5.24	RING INSTALLATION	1785				
5.24	6.05	MINING		-	-	-	INCOMPLETE PUSH
6.05	6.54	DELAY		-	-	-	BELTS DOWN (#1 SLIPPING)
6.54	7.02	MINING		1.50	3-8,11-1620-24	12500	COMPLETED PUSH
7.02	7.13	RING INSTALLATION	1786				
7.13	8.00	MINING		1.10	3,4,11-24	13500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.15	MINING		0.40	3,4,11-24	13500	COMPLETED PUSH
8.15	8.25	RING INSTALLATION	1788				
8.25	9.20	MINING		-	-	-	INCOMPLETE PUSH
9.20	9.25	DELAY		-	-	-	EXPAND RING #1787
9.25	9.35	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
9.35	9.45	RING INSTALLATION	1789				
9.45	10.20	MINING		-	-	-	INCOMPLETE PUSH
10.20	10.25	DELAY		-	-	-	EXPAND RING #1788
10.25	10.40	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
10.40	10.50	RING INSTALLATION	1790				
10.50	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43B,42A,16,31,39,30. PINNED RING #1788 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.25	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
15.25	15.50	MINING		-	-	-	INCOMPLETE PUSH
15.50	15.55	DELAY		-	-	-	EXPAND RING #1789

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 18,1984
Chainage :Start 2661.38 m
End 2684.88 m
Advance for day 23.50 m

File Name: DY10-18A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
15.55	16.00	MINING		1.00	3,4,11-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.20	MINING		0.50	3-24	15000	COMPLETED PUSH
16.20	16.33	RING INSTALLATION	1791				
16.33	17.17	MINING		1.50	3-16,21-24	13000	-
17.17	17.28	RING INSTALLATION	1792				
17.28	18.18	MINING		1.50	3-16,21-24	13000	-
18.18	18.30	RING INSTALLATION	1793				
18.30	19.13	MINING		1.50	3-16,21-24	13000	-
19.13	19.24	RING INSTALLATION	1794				
19.24	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.50	DELAY		-	-	-	BROKEN WATER PIPE
20.50	21.02	MINING		1.50	3-16,21-24	13000	COMPLETED PUSH
21.02	21.13	RING INSTALLATION	1795				
21.13	21.56	MINING		1.50	3-16,21-24	13000	-
21.56	22.10	RING INSTALLATION	1796				
22.10	22.57	MINING		1.50	3,4,16-24	15000	-
22.57	23.10	RING INSTALLATION	1797				
23.10	23.15	DELAY		-	-	-	REPAIR SECONDARY BELT
23.15	23.40	MINING		0.70	3,4,16-24	15000	INCOMPLETE PUSH
23.40	24.00	DELAY		-	-	-	PRIMARY BELT JAMMED WITH MUCK.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 19,1985
Chainage: Start 2684.88 m
End 2697.87 m
Advance for day 12.99 m

File Name: DY10-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.38	DELAY					PRIMARY BELT JAMMED WITH MUCK
0.38	0.48	MINING		-	-	-	INCOMPLETE PUSH
0.48	1.18	DELAY		-	-	-	POWER TROUBLE
1.18	1.44	MINING		0.80	3,4,13-24	15000	COMPLETED PUSH
1.44	1.59	RING INSTALLATION	1798				
1.59	3.04	MINING		1.50	3,4,12-24	15000	-
3.04	3.14	RING INSTALLATION	1799				
3.14	4.20	MINING		1.50	3,4,12-24	15000	-
4.20	4.50	LUNCH					
4.50	5.06	RING INSTALLATION	1800				
5.06	6.05	MINING		1.50	3,4,12-24	15000	SECONDARY BELT SLIPPING
6.05	6.15	RING INSTALLATION	1801				
6.15	6.24	MINING		-	-	-	INCOMPLETE PUSH
6.24	6.34	DELAY		-	-	-	POWER OFF IN TUNNEL.
6.34	7.10	MINING		-	-	-	INCOMPLETE PUSH
7.10	7.18	DELAY		-	-	-	POWER OF IN TUNNEL
7.18	7.37	MINING		1.50	3,4,12-24	15000	COMPLETED PUSH
7.37	7.49	RING INSTALLATION	1802				
7.49	8.00	MINING		0.30	3,4,6,8,12-24	11500	
		-- SHIFT CHANGE------					
8.00	8.30	MINING		-	-	-	INCOMPLETE PUSH
8.30	8.35	DELAY		-	-	-	EXPAND RING #1801
8.35	8.50	MINING		1.20	3,4,11-24	12000	COMPLETED PUSH
8.50	9.00	RING INSTALLATION	1803				
9.00	9.15	DELAY		-	-	-	CHECKING #3 & 4 MAIN DRIVE MOTORS.
9.15	9.45	MINING		-	-	-	INCOMPLETE PUSH
9.45	9.50	DELAY		-	-	-	EXPAND RING #1802
9.50	10.15	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
10.15	10.30	RING INSTALLATION	1804				
10.30	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43A,42B,33,29,37,32,26
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #1802 WITH 4 SETS OF PINS
12.00	12.30	LUNCH					
12.30	16.00	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
		-- SHIFT CHANGE------					
16.00	17.30	MAINTENANCE		-	-	-	CONTINUING TO INSTALL NEW SCRUBBER FAN

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 19,1985
Chainage: Start 2684.88 m
End 2697.87 m
Advance for day 12.99 m

File Name: DY10-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.30	18.22	MINING		1.50	3,4,13-24	13000	-
18.22	18.37	RING INSTALLATION	1805				
18.37	18.47	MINING		-	-	-	INCOMPLETE PUSH
18.47	18.46	DELAY		-	-	-	WATER BUILD UP AT FACE
18.46	19.14	MINING		-	-	-	INCOMPLETE PUSH
19.14	19.24	DELAY		-	-	-	INSTALL MESH
19.24	19.42	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
19.42	19.49	DELAY		-	-	-	WATER BUILD UP AT FACE
19.49	20.00	RING INSTALLATION	1806				
20.00	20.30	LUNCH					
20.30	20.35	MINING		0.20	3,4,13-24	13000	INCOMPLETE PUSH
20.35	24.00	DELAY		-	-	-	SEVERED ELECTRICAL CABLE
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 20,1984
Chainage :Start 2697.87 m
End 2703.67 m
Advance for day 5.80 m

File Name: DY10-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	3.16	DELAY		-	-	-	POWER TROUBLE REPAIR O/H STRUCTURE
3.16	4.05	MINING		1.30	3,4,6,8,10,12-16,18,20-24	10500	COMPLETED PUSH
4.05	4.19	RING INSTALLATION	1807				
4.19	5.00	MINING		-	-	-	INCOMPLETE PUSH
5.00	5.25	LUNCH					
5.25	5.43	MINING		1.50	3,4,6,8,10,12-16,21-24	13000	COMPLETED PUSH
5.43	5.57	RING INSTALLATION	1808				
5.57	6.46	MINING		1.50	3,4,6,8,10,12-16,21-24	13500	-
6.46	6.58	RING INSTALLATION	1809				
6.58	8.00	MINING		1.50	3-8,11-16,21-24	13500	-
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes: SEVEN MOTORS USED DURING SHIFT

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 22,1984
Chainage :Start 2703.50 m REVISED
End 2711.80 m
Advance for day 8.30 m

File Name: DY10-22A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.18	-- SHIFT CHANGE------					
8.18	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #12,14,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.32	MAINTENANCE		-	-	-	END CUTTER CHANGE START UP BELTS
14.32	15.04	RING INSTALLATION	1810				TROUBLE LINING UP RING TO THE PUSH RING
15.04	15.18	MINING		0.30	3,4,12-16,18, 20-24	16500	INCOMPLETE PUSH
15.18	15.27	DELAY		-	-	-	INSTALL MESH & LAGGING
15.27	15.46	DELAY		-	-	-	SECONDARY CONVEYOR SLIPPING BROKEN BOLTS(POTHEAD ON DRIVE MOTOR FOR THE CONVEYOR)
15.46	16.00	-- SHIFT CHANGE------					
16.00	17.05	DELAY		-	-	-	ELECTRICAL TROUBLE (SECONDARY BELT)
17.05	18.00	MINING		1.20	3-8,12-24	11000	COMPLETED PUSH
18.00	18.10	RING INSTALLATION	1811				
18.10	18.20	DELAY		-	-	-	NO.3 SWASH NOT WORKING (CHECK HYDRLC. PUMPS)
18.20	19.25	MINING		1.50	3-8,12-24	11000	-
19.25	19.35	RING INSTALLATION	1812				
19.35	20.15	MINING		-	-	-	INCOMPLETE PUSH
20.15	20.45	LUNCH					
20.45	21.05	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
21.05	21.15	RING INSTALLATION	1813				
21.15	22.10	MINING		1.50	3,4,11-24	12000	-
22.10	22.20	RING INSTALLATION	1814				
22.20	23.10	MINING		1.50	3,4,12-24	12000	-
23.10	23.20	RING INSTALLATION	1815				
23.20	23.30	MINING		-	-	-	INCOMPLETE PUSH
23.30	23.40	DELAY					PUSH PUMP POWER OFF(ACCIDENTLY TRIPPED)
23.40	24.00	MINING		0.80	3,4,11-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 23,1984
Chainage :Start 2711.80 m
End 2736.50 m
Advance for day 24.70 m

File Name: DY10-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.25	MINING		0.70	3,4,13-24	11000	COMPLETED PUSH
0.25	0.39	RING INSTALLATION	1816				
0.39	1.35	MINING		1.50	3,4,13-24	11000	-
1.35	1.45	RING INSTALLATION	1817				
1.45	2.43	MINING		1.50	3,4,13-24	12000	-
2.43	2.59	RING INSTALLATION	1818				
2.59	3.52	MINING		1.50	3,4,13-24	12000	-
3.52	4.05	RING INSTALLATION	1819				
4.05	4.20	MINING		-	-	-	INCOMPLETE PUSH
4.20	4.50	LUNCH					
4.50	5.38	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
5.38	5.50	RING INSTALLATION	1820				
5.50	6.40	MINING		1.50	3,4,13-24	12000	-
6.40	6.52	RING INSTALLATION	1821				
6.52	7.25	DELAY		-	-	-	WATER BUILD UP AT FACE
7.25	8.00	MINING		1.20	3,4,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.15	MINING		0.30	-	-	COMPLETED PUSH
8.15	8.38	DELAY		-	-	-	WATER AT FACE
8.38	8.55	RING INSTALLATION	1822				
8.55	9.49	MINING		1.50	3-8,17-24	10000	-
9.49	10.02	RING INSTALLATION	1823				
10.02	10.49	MINING		1.50	3-8,10-13,18, 20-24	10000	-
10.49	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #43B,42A,9,15. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.32	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
14.32	14.48	RING INSTALLATION	1824				
14.48	15.42	MINING		1.50	2-4,12-1620-24	13500	-
15.42	15.58	RING INSTALLATION	1825				
15.58	16.00	MINING		-	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.40	MINING		-	-	-	INCOMPLETE PUSH
16.40	16.45	DELAY		-	-	-	EXPAND RING #1824
16.45	16.55	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 23,1984
Chainage: Start 2711.80 m
End 2736.50 m
Advance for day 24.70 m

File Name: DY10-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.55	17.05	RING INSTALLATION	1826				
17.05	17.15	DELAY		-	-	-	MAIN CONVEYORS OFF
17.15	17.40	MINING		-	-	-	INCOMPLETE PUSH
17.40	17.45	DELAY		-	-	-	EXPAND RING #1825
17.45	18.10	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
18.10	18.20	RING INSTALLATION	1827				
18.20	18.45	MINING		-	-	-	INCOMPLETE PUSH
18.45	18.50	DELAY		-	-	-	EXPAND RING #1826
18.50	19.15	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
19.15	19.25	RING INSTALLATIGN	1828				
19.25	19.45	MINING		-	-	-	INCOMPLETE PUSH
19.45	19.50	DELAY		-	-	-	EXPAND RING #1827
19.50	20.20	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
20.20	20.50	LUNCH					
20.50	21.00	RING INSTALLATION	1829				
21.00	21.30	MINING		-	-	-	INCOMPLETE PUSH
21.30	21.35	DELAY		-	-	-	EXPAND RING #1828
21.35	22.00	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
22.00	22.10	RING INSTALLATION	1830				
22.10	22.35	MINING		-	-	-	INCOMPLETE PUSH
22.35	22.40	DELAY		-	-	-	EXPAND RING #1829
22.40	23.05	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
23.05	23.15	RING INSTALLATION	1831				
23.15	23.40	MINING		-	-	-	INCOMPLETE PUSH
23.40	23.45	DELAY		-	-	-	EXPAND RING #1830
23.45	24.00	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 24,1984
Chainage :Start 2736.50 m
End 2760.50 m
Advance for day 24.00 m

File Name: DY10-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.15	RING INSTALLATION	1832				
0.15	0.28	MINING		-	-	-	INCOMPLETE PUSH
0.28	0.43	DELAY		-	-	-	MAIN CONVEYOR SLIPPING
0.43	0.50	MINING		-	-	-	INCOMPLETE PUSH
0.50	0.52	DELAY		-	-	-	INST'D SPACER BLOCKS
0.52	1.16	MINING		1.50	3-16,21-24	12000	COMPLETED PUSH
1.16	1.28	RING INSTALLATION	1833				
1.28	1.36	MINING		-	-	-	INCOMPLETE PUSH
1.36	1.42	DELAY		-	-	-	PRIMARY BELT JAMMED WITH MUCK.
1.42	1.57	DELAY		-	-	-	BELTS SLIPPING
1.57	2.05	MINING		-	-	-	INCOMPLETE PUSH
2.05	2.07	DELAY		-	-	-	INST'D SPACER BLOCKS
2.07	2.40	MINING		1.50	3-16,21-24	12000	COMPLETED PUSH
2.40	2.50	RING INSTALLATION	1834				
2.50	3.10	MINING		-	-	-	INCOMPLETE PUSH
3.10	3.12	DELAY		-	-	-	INST'D SPACER BLOCKS
3.12	3.40	MINING		1.50	3-8,21-24	12000	COMPLETED PUSH
3.40	3.53	RING INSTALLATION	1835				
3.53	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	4.56	MINING		-	-	-	INCOMPLETE PUSH
4.56	4.58	DELAY		-	-	-	INST'D SPACER BLOCKS
4.58	5.18	MINING		1.50	3-8,17-24	12000	COMPLETED PUSH
5.18	5.30	RING INSTALLATION	1836				
5.30	6.00	MINING		-	-	-	INCOMPLETE PUSH
6.00	6.02	DELAY		-	-	-	INST'D SPACER BLOCKS
6.02	6.22	MINING		1.50	3-8,17-24	12000	COMPLETED PUSH
6.22	6.36	RING INSTALLATION	1837				
6.36	7.06	MINING		-	-	-	INCOMPLETE PUSH
7.06	7.08	DELAY		-	-	-	INST'D SPACER BLOCKS
7.08	7.28	MINING		1.50	3-8,17-24	12000	COMPLETED PUSH
7.28	7.38	RING INSTALLATION	1838				
7.38	8.00	MINING		0.60	3-8,17-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.30	MINING		0.90	3-8,12,17-24	11000	COMPLETED PUSH
8.30	8.42	RING INSTALLATION	1839				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 24,1984
Chainage: Start 2736.50 m
End 2760.50 m
Advance for day 24.00 m

File Name: DY10-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.42	9.33	MINING		1.50	3,4,10,1-24	10500	-
9.33	9.47	RING INSTALLATION	1840				
9.47	10.13	MINING		-	3,4,10,12-24	10000	INCOMPLETE PUSH
10.13	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							CHANGED CUTTERS #43,42A,21,22.
12.00	12.30	LUNCH					MAIN CONVEYOR SLIPPING
12.30	14.20	MAINTENANCE		-	-	-	
14.20	14.38	DRILLING					CONTINUED AS ABOVE
14.38	15.04	MINING		1.50	-	-	DRILLED OFF 25' INSTRUMENTATION HOLE -UP
15.04	15.19	RING INSTALLATION	1841				COMPLETED PUSH
15.19	16.00	MINING		1.20	3,4,13-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.15	MINING		0.30	3,4,12-24	11000	COMPLETED PUSH
16.15	16.30	RING INSTALLATION	1842				
16.30	17.00	MINING		-	-	-	INCOMPLETE PUSH
17.00	17.05	DELAY		-	-	-	EXPAND RING #1841
17.05	17.30	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
17.30	17.40	RING INSTALLATION	1843				
17.40	18.05	MINING		-	-	-	INCOMPLETE PUSH
18.05	18.10	DELAY		-	-	-	EXPAND RING #1842
18.10	18.35	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
18.35	18.45	RING INSTALLATION	1844				
18.45	19.10	MINING		-	-	-	INCOMPLETE PUSH
19.10	19.15	DELAY		-	-	-	EXPAND RING #1843
19.15	19.40	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
19.40	19.50	RING INSTALLATION	1845				
19.50	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.15	DELAY		-	-	-	EXPAND RING #1844
20.15	20.45	LUNCH					
20.45	21.15	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
21.15	21.25	RING INSTALLATION	1846				
21.25	21.50	MINING		-	-	-	INCOMPLETE PUSH
21.50	21.55	DELAY		-	-	-	EXPAND RING #1845
21.55	22.05	MINING		-	-	-	INCOMPLETE PUSH
22.05	22.20	DELAY		-	-	-	BELT STOPPAGE, BROKEN CHUTE CHAIN

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY10-24A

Project No: 831-6014

Date: OCTOBER 24,1984
Chainage: Start 2736.50 m
End 2760.50 m
Advance for day 24.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
				1.50	3,4,11-24	12000	COMPLETED PUSH
22.20	22.35	MINING					
22.35	22.45	RING INSTALLATION	1847	-	-	-	INCOMPLETE PUSH
22.45	23.10	MINING		-	-	-	EXPAND RING #1846
23.10	23.15	DELAY		1.50	3,4,12-24	12000	COMPLETED PUSH
23.15	23.45	MINING					
23.45	24.00	RING INSTALLATION	1848				
		-- SHIFT CHANGE					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 25,1984
Chainage: Start 2760.50 m
End 2777.14 m
Advance for day 16.64 m

File Name: DY10-25A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.30	MINING		-	-	-	INCOMPLETE PUSH
0.30	0.32	DELAY		-	-	-	INST'D SPACER BLOCKS
0.32	0.48	MINING		1.50	3,4,9-16,18, 20-24	12000	COMPLETED PUSH
0.48	1.00	RING INSTALLATION	1849				
1.00	1.30	MINING		-	-	-	INCOMPLETE PUSH
1.30	1.32	DELAY		-	-	-	INST'D SPACER BLOCKS
1.32	1.53	MINING		1.50	3,4,9-16,18, 20-24	12000	COMPLETED PUSH
1.53	2.03	RING INSTALLATION	1850				
2.03	2.31	MINING		-	-	-	INCOMPLETE PUSH
2.31	2.33	DELAY		-	-	-	INST'D SPACER BLOCKS
2.33	2.50	MINING		-	-	-	INCOMPLETE PUSH
2.50	3.05	DELAY		-	-	-	SPILLAGE AT SECONDARY BELT CHUTE.
3.05	3.16	MINING		1.50	3,4,9-16,18, 20-24	12000	COMPLETED PUSH
3.16	3.26	RING INSTALLATION	1851				
3.26	3.43	MAINTENANCE & DELAY-?		-	-	-	INST'D WATER PIPE.
3.43	4.20	MINING		-	-	-	INCOMPLETE PUSH
4.20	4.50	LUNCH					
4.50	5.05	MINING		-	-	-	INCOMPLETE PUSH
5.05	5.07	DELAY		-	-	-	INST'D SPACER BLOCKS
5.07	5.15	MINING		1.50	3,4,9-16,18, 20-24	12000	COMPLETED PUSH
5.15	5.33	RING INSTALLATION	1852				
5.33	6.04	MINING		-	-	-	INCOMPLETE PUSH
6.04	6.11	DELAY		-	-	-	INST'D SPACER BLOCKS
6.11	6.30	MINING		1.50	3,4,9-16,18, 20-24	12000	COMPLETED PUSH
6.30	6.50	RING INSTALLATION	1853				
6.50	7.20	MINING		-	-	-	INCOMPLETE PUSH
7.20	7.22	DELAY		-	-	-	INST'D SPACER BLOCKS
7.22	8.00	MINING		1.50	3,4,9-16,18 20-24	12000	COMPLETED PUSH
		-- SHIFT CHANGE------					
8.00	8.16	RING INSTALLATION	1854				

Notes:

Donkin-Morien Developaent Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 25,1984
Chainage :Start 2760.50 m
End 2777.14 m
Advance for day 16.64 m

File Name: DY10-25A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.16	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							CHANGED CUTTERS #43,42,36,10.
12.00	12.30	LUNCH					
12.30	15.18	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
15.18	15.57	MINING		0.80	3-8,13-1621-24	12500	INCOMPLETE PUSH
15.57	16.00	DELAY		-	-	-	PLUGGED CHUTE AND SPILLAGE
		-- SHIFT CHANGE------					
16.00	16.15	DELAY		-	-	-	CONTINUED AS ABOVE
16.15	16.40	MINING		0.70	3-8,12-24	10000	COMPLETED PUSH
16.40	16.50	RING INSTALLATION	1855				
16.50	17.20	MINING		-	-	-	INCOMPLETE PUSH
17.20	17.25	DELAY		-	-	-	EXPAND RING #1854
17.25	17.55	MINING		1.50	3-8,11-24	10000	COMPLETED PUSH
17.55	18.05	RING INSTALLATION	1856				
18.05	18.15	DELAY		-	-	-	CHECKED WATER SPRAYS
18.15	18.25	DELAY		-	-	-	ELECTRICAL TROUBLE
18.25	18.35	DELAY		-	-	-	PRIMARY BELT SLIPPING
18.35	19.05	MINING		-	-	-	INCOMPLETE PUSH
19.05	19.20	DELAY		-	-	-	ELECTRICAL TROUBLE-EXPANDED RING #1855 WHILE WAITING.
19.20	19.50	MINING		1.50	3-8,12-24	10000	COMPLETED PUSH
19.50	20.00	RING INSTALLATION	1857				
20.00	20.15	MAINTENANCE & DELAY-?		-	-	-	ADJUSTING CHUTE TO #4 CONVEYOR
20.15	20.45	LUNCH					
20.45	21.10	DELAY		-	-	-	SKID STUCK!
21.10	21.45	MINING		-	-	-	INCOMPLETE PUSH
21.45	21.50	DELAY		-	-	-	EXPAND RING #1856
21.50	22.20	MINING		1.50	3,4,12-24	10000	COMPLETED PUSH
22.20	22.30	RING INSTALLATION	1858				
22.30	23.00	MINING		-	-	-	INCOMPLETE PUSH
23.00	23.05	DELAY		-	-	-	EXPAND RING #1857
23.05	23.40	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
23.40	23.50	RING INSTALLATION	1859				
23.50	24.00	MINING		0.30	3,4,11,1216-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

otes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 26,1984
Chainage: Start 2777.14 m
End 2794.24 m
Advance for day 17.10 m

File Name: DY10-26A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.40	MINING		-	-	-	INCOMPLETE PUSH
0.40	0.42	DELAY					INSTALL SPACER BLOCKS
0.42	0.50	MINING		1.20	3,4,9-12,17-24	13000	COMPLETED PUSH
0.50	1.05	RING INSTALLATION	1860				
1.05	2.02	MINING		-	-	-	INCOMPLETE PUSH
2.02	2.08	DELAY					PRIMARY BELT STOPPED(JAMMED WITH MUCK)
2.08	2.10	MINING		-	-	-	INCOMPLETE PUSH
2.10	2.12	DELAY					INSTALL SPACER BLOCKS
2.12	2.25	MINING		1.50	3,4,9-12,17-24	13000	COMPLETED PUSH
2.25	2.40	RING INSTALLATION	1861				
2.40	3.11	MINING		-	-	-	INCOMPLETE PUSH
3.11	3.24	DELAY					SECONDARY CHUTE SPILLAGE
3.24	3.40	MINING		-	-	-	INCOMPLETE PUSH
3.40	3.42	DELAY					INSTALL SPACER BLOCKS
3.42	4.00	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
4.00	4.12	RING INSTALLATION	1862				
4.12	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.36	MINING		-	-	-	INCOMPLETE PUSH
5.36	5.40	DELAY					INSTALL SPACER BLOCKS
5.40	6.00	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
6.00	6.15	RING INSTALLATION	1863				
6.15	7.05	MINING		-	-	-	INCOMPLETE PUSH
7.05	7.07	DELAY					INSTALL SPACER BLOCKS
7.07	7.23	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
7.23	7.35	RING INSTALLATION	1864				
7.35	8.00	MINING		0.60	3,4,13-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.54	MINING		0.90	3,4,11-24	12000	COMPLETED PUSH
8.54	9.12	RING INSTALLATION	1865				
9.12	10.14	MINING		1.50	3,4,11-24	11500	-
10.14	10.27	RING INSTALLATION	1866				
10.27	10.55	MINING		-	-	-	INCOMPLETE PUSH
10.55	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,18,42B,43A. ASSORTED MACHINE MAINTENANCE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: OCTOBER 26,1984 — File Name: DY10-26A
Chainage: Start 2777.14 m — Project No: 831-6014
End 2794.24 m
Advance for day 17.10 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
12.00	12.30	LUNCH					
12.30	15.31	MAINTENANCE		-	-	-	END CUTTER CHANGE
15.31	16.00	MINING		1.30	3,4,13-24	13500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.12	MINING		0.20	3,4,13-24	13500	COMPLETED PUSH
16.12	-	DELAY					REPLACE BLOWN PLUG(FLUID COUPLING NO.4 MAIN CONVEYOR)
17.50	18.05	RING INSTALLATION	1867				
-	19.12						INSTALL BOLTS TO MOVE PUSH RING (NO.9 & 10 CYLINDERS)
19.12	19.40	MINING		-	-	-	INCOMPLETE PUSH
19.40	19.45	DELAY					EXPAND RING #1866
19.45	20.20	MINING		1.50	3-8,11-24	13000	COMPLETED PUSH
20.20	20.30	RING INSTALLATION	1868				
20.30	21.00	LUNCH					
21.00	21.35	MINING		-	-	-	INCOMPLETE PUSH
21.35	21.40	DELAY					EXPAND RING #1867
21.40	22.00	MINING		1.50	3-8,12-24	14000	COMPLETED PUSH
22.00	22.10	RING INSTALLATION	1869				
22.10	22.30	MINING		-	-	-	INCOMPLETE PUSH
22.30	22.35	DELAY					EXPAND RING #1868
22.35	23.05	MINING		1.50	3,4,11-24	14000	COMPLETED PUSH
23.05	23.15	RING INSTALLATION	1870				
23.15	23.23	MINING		-	-	-	INCOMPLETE PUSH
23.23	23.33	DELAY					POWER KICKED OFF
23.33	23.55	MINING		0.90	3,4,12-24	14000	INCOMPLETE PUSH
23.55	24.00	DELAY					EXPAND RING #1869
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 27,1984
Chainage :Start 2794.24 m
End 2803.34 m
Advance for day 9.10 m

File Name: DY10-27A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.27	MINING		0.60	3,4,9-14,17-24	15000	COMPLETED PUSH (INCL.SPACER BLOCK INST)
0.27	0.50	DELAY					BOLT NO.3 & 4 PISTONS TO PUSH RING
0.50	1.00	RING INSTALLATION	1871				
1.00	1.30	MINING		-	-	-	INCOMPLETE PUSH
1.30	1.32	DELAY					INSTALL SPACER BLOCKS
1.32	1.58	MINING		1.50	3,4,9-14,17-24	15000	COMPLETED PUSH
1.58	2.07	RING INSTALLATION	1872				
2.07	2.38	MINING		-	-	-	INCOMPLETE PUSH
2.38	2.40	DELAY					INSTALL SPACER BLOCKS
2.40	2.47	DELAY					NO.4 BELT DOWN(LOOSE ELEC.CABLE COUPLE)
2.47	3.10	MINING		1.50	3,4,9-14,17-24	15000	COMPLETED PUSH
3.10	3.21	RING INSTALLATION	1873				
3.21	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.02	DELAY					INSTALL SPACER BLOCKS
4.02	4.15	MINING		1.50	3,4,9-14,17-24	13000	COMPLETED PUSH
4.15	4.27	RING INSTALLATION	1874				
4.27	4.45	MINING		-	-	-	INCOMPLETE PUSH
4.45	5.15	LUNCH					
5.15	5.55	MINING		-	-	-	INCOMPLETE PUSH
5.55	6.00	DELAY					SECONDARY BELT DOWN(TRANS. TRIPPED OFF)
6.00	6.05	MINING		-	-	-	INCOMPLETE PUSH
6.05	6.07	DELAY					INSTALL SPACER BLOCKS
6.07	6.15	MINING		1.50	3,4,9-14,17-24	13000	COMPLETED PUSH
6.15	6.24	RING INSTALLATION	1875				
6.24	7.00	MINING		-	-	-	INCOMPLETE PUSH
7.00	7.02	DELAY					INSTALL SPACER BLOCKS
7.02	7.20	MINING		1.50	3,4,9-14,17-24	13000	COMPLETED PUSH
7.20	7.34	RING INSTALLATION	1876				
7.34	8.04	MINING		-	-	-	INCOMPLETE PUSH
8.04	8.06	DELAY					INSTALL SPACER BLOCKS
8.06	8.15	MINING		0.20	3,4,9-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 29,1984 REVISED File Name: DY10-29A
Chainage :Start 2803.55 m Project No: 831-6014
End 2816.65 m
Advance for day 13.10 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.16	-- SHIFT CHANGE------					
8.16	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #42B,43A.
							ASSORTED MACHINE MAINTENANCE
							PINNED RING #1874 WITH 4 SETS OF PINS
12.00	12.30	LUNCH					
12.30	12.40	DELAY		-	-	-	HOOK UP VENTILATION DUCTING AT HEAD
12.40	13.00	DELAY		-	-	-	NO.5 & 6 MOTORS NOT MAKING CONTACT
13.00	13.30	MINING		0.50	3-24	15000	COMPLETED PUSH
13.30	13.44	RING INSTALLATION	1877				
13.44	14.14	MINING		-	-	-	INCOMPLETE PUSH
14.14	14.22	DELAY					INSTALL SPACER BLOCKS
14.22	14.42	MINING		1.50	3-24	12000	COMPLETED PUSH
14.42	14.53	RING INSTALLATION	1878				
14.53	15.19	MINING		-	-	-	INCOMPLETE PUSH
15.19	15.23	DELAY					INSTALL SPACER BLOCKS
15.23	15.52	MINING		1.47	3-12,17-24	15000	COMPLETED PUSH
15.52	16.00	RING INSTALLATION	1879				
		-- SHIFT CHANGE------					
16.00	16.54	MINING		1.50	3,4,11-13,15, 17-24	14000	-
16.54	17.06	RING INSTALLATION	1880				
17.06	17.57	MINING		1.50	3,4 11-13,15, 17-24	14500	-
17.57	18.13	RING INSTALLATION	1881				
18.13	19.14	MINING		1.50	3,4,11-13,15, 17-24	14500	-
19.14	19.30	RING INSTALLATION	1882				
19.30	19.39	DELAY					PUT ON WATER LINE
19.39	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.03	MINING		1.50	3,4,11-13,15, 17-24	14500	COMPLETED PUSH
21.03	21.17	RING INSTALLATION	1883				
21.17	22.18	MINING		1.50	3,11-13,15, 21-24	14000	-

Notes: TOTAL OF 16 MINUTES DURING 16.00-24.00 SHIFT TO INSTALL SPACERS(INCLUDED WITH MINING TIME)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 29,1984 — File Name: DY10-29A
Chainage :Start 2803.55 m REVISED
End 2816.65 m — Project No: 831-6014
Advance for day 13.10 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.18	22.31	RING INSTALLATION	1884				
22.31	23.26	MINING		1.50	3,4,11,12,14, 16-24	14500	-
23.26	23.39	RING INSTALLATION	1885				
23.39	24.00	MINING		0.60	3,4,11,12,14, 16,17-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes: TOTAL OF 16 MINUTES DURING 16.00-24.00 SHIFT TO INSTALL SPACERS(INCLUDED WITH MINING TIME)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 30,1984
Chainage :Start 2816.65 m
End 2836.41 m
Advance for day 19.76 m

File Name: DY10-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.35	MINING		0.90	3,4,11-24	14000	COMPLETED PUSH
0.35	0.45	RING INSTALLATION	1886				
0.45	1.10	MINING		-	-	-	INCOMPLETE PUSH
1.10	1.15	DELAY					EXPAND RING #1885
1.15	1.40	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
1.40	1.50	RING INSTALLATION	1887				
1.50	2.15	MINING		-	-	-	INCOMPLETE PUSH
2.15	2.20	DELAY					EXPAND RING #1886
2.20	2.45	MINING		1.50	3,4,11-24	14000	COMPLETED PUSH
2.45	2.55	RING INSTALLATION	1888				
2.55	3.20	MINING		-	-	-	INCOMPLETE PUSH
3.20	3.25	DELAY					EXPAND RING #1887
3.25	3.50	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
3.50	4.00	RING INSTALLATION	1889				
4.00	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.00	MINING		-	-	-	INCOMPLETE PUSH
5.00	5.05	DELAY					EXPAND RING #1888
5.05	5.10	MINING		-	-	-	INCOMPLETE PUSH
5.10	7.20	DELAY					REPLACE HYDRLC. HOSE(PUSH PUMP RETURN)
7.20	7.30	MINING		1.50	3,4,11-24	14000	COMPLETED PUSH
7.30	7.40	RING INSTALLATION	1890				
7.40	8.00	MINING		0.60	3,4,12-24	14000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.35	MINING		0.66	3-24	13000	COMPLETED PUSH
8.35	8.46	RING INSTALLATION	1891				
8.46	9.31	MINING		-	-	-	INCOMPLETE PUSH
9.31	9.36	DELAY					G. CURRY & CO. LOOKING INSIDE HEAD
9.36	9.40	MINING		-	-	-	INCOMPLETE PUSH
9.40	9.43	DELAY					INSTALL SPACER BLOCKS
9.43	9.47	MINING		1.50	3-24	13000	COMPLETED PUSH
9.47	9.56	RING INSTALLATION	1892				
9.56	10.22	MINING		-	-	-	INCOMPLETE PUSH
10.22	10.26	DELAY					INSTALL SPACER BLOCKS
10.26	10.29	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 30,1984
Chainage :Start 2816.65 m
End 2836.41 m
Advance for day 19.76 m

File Name: DY10-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
10.29	10.46	DELAY					NO.2 BELT DOWN
10.46	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #6,30,42A,43B. PINNED RING #1890 WITH 4 SETS OF PINS ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.15	MAINTENANCE		-	-	-	END CUTTER CHANGE
15.15	15.55	DELAY					HOOK UP NO.4 PUMP OUT TEST
15.55	16.00	MINING		0.94	3-16,18,20-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.25	MINING		0.56	3,4,5-8,11-16, 18,20-24	14000	COMPLETED PUSH
16.25	16.40	RING INSTALLATION	1893				
16.40	17.33	MINING		1.50	3,4,8,11,12, 13-16,18,20-24	12500	-
17.33	17.46	RING INSTALLATION	1894				
17.46	18.39	MINING		1.50	3,4,11,12,14, 16-24	12500	-
18.39	18.52	RING INSTALLATION	1895				
18.52	19.50	MINING		1.50	3-8,11,12,14, 16-24	10500	-
19.50	20.02	RING INSTALLATION	1896				
20.02	20.17	MINING		-	-	-	INCOMPLETE PUSH
20.17	20.47	LUNCH					
20.47	21.36	MINING		1.50	3,4,11,12,14, 16-24	13000	COMPLETED PUSH
21.36	21.46	RING INSTALLATION	1897				
21.46	22.53	MINING		1.50	3-8,13-24	11000	-
22.53	23.06	RING INSTALLATION	1898				
23.06	23.48	MINING		1.10	3-8,11-16, 21-24	12000	INCOMPLETE PUSH
23.48	24.00	DELAY					POWER OFF TO OUTSTATION NO. 3
		-- SHIFT CHANGE------					

Notes: TOTAL OF 15 MINUTES DURING 16.00-24.00 SHIFT TO INSTALL SPACERS(INCLUDED WITH MINING TIME

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 31,1984 — File Name: DY10-31A
Chainage :Start 2836.41 m
End 2857.71 m — Project No: 931-6014
Advance for day 21.30 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.17	DELAY					NO POWER (NO.2 STATION SWITCH IS OFF)
0.17	0.31	MINING		0.40	3-8,12-24	11000	COMPLETED PUSH
0.31	0.45	RING INSTALLATION	1899				
0.45	1.15	MINING		-	-	-	INCOMPLETE PUSH
1.15	1.20	DELAY					EXPAND RING #1898
1.20	1.50	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
1.50	2.03	RING INSTALLATION	1900				
2.03	2.30	MINING		-	-	-	INCOMPLETE PUSH
2.30	2.35	DELAY					EXPAND RING #1899
2.35	2.55	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
2.55	3.05	RING INSTALLATION	1901				
3.05	3.30	MINING		-	-	-	INCOMPLETE PUSH
3.30	3.35	DELAY					EXPAND RING #1900
3.35	3.50	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
3.50	4.00	RING INSTALLATION	1902				
4.00	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.00	MINING		-	-	-	INCOMPLETE PUSH
5.00	5.05	DELAY					EXPAND RING #1901
5.05	5.20	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
5.20	5.45	RING INSTALLATION	1903				PUSH RING PIN STRIPPED(USE COME-ALONG)
5.45	6.15	MINING		-	-	-	INCOMPLETE PUSH
6.15	6.20	DELAY					EXPAND RING #1902
6.20	6.35	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
6.35	6.50	RING INSTALLATION	1904				
6.50	7.15	MINING		-	-	-	INCOMPLETE PUSH
7.15	7.20	DELAY					EXPAND RING #1903
7.20	7.40	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
7.40	8.00	RING INSTALLATION	1905				PARTIAL INSTALLATION
		-- SHIFT CHANGE------					
8.00	8.23	RING INSTALLATION	1905				COMPLETE INSTALLATION
8.23	8.53	MINING		-	-	-	INCOMPLETE PUSH
8.53	8.57	DELAY					INSTALL SPACER BLOCKS
8.57	9.15	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
9.15	9.31	RING INSTALLATION	1906				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date OCTOBER 31,1984
Chainage :Start 2836.41 m
End 2857.71 m
Advance for day 21.30 m

File Name: DY10-31A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
9.31	9.59	MINING		-	-	-	INCOMPLETE PUSH
9.59	10.14	DELAY					NO.4 BELT DOWN & INSTALL SPACER BLOCKS
10.14	10.33	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
10.33	10.41	RING INSTALLATION	1907				
10.41	10.55	MINING		-	-	-	INCOMPLETE PUSH
10.55	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #24,40,42B,43A.
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.05	MAINTENANCE		-	-	-	END CUTTER CHANGE
15.05	15.15	MINING		-	-	-	INCOMPLETE PUSH
15.15	15.25	DELAY					T.B.M. CUTTING OUT(ELECTRICAL CONTACTS)
15.25	15.53	MINING		1.50	3-8,17-24	13000	COMPLETED PUSH
15.53	16.00	RING INSTALLATION	1908				PARTIAL INSTALLATION
		-- SHIFT CHANGE------					
16.00	16.05	RING INSTALLATION	1908				COMPLETE INSTALLATION
16.05	16.54	MINING		1.50	3-8,14,16-24	11500	-
16.54	17.08	RING INSTALLATION	1909				
17.08	17.57	MINING		1.50	3,4,12-24	12000	-
17.57	18.08	RING INSTALLATION	1910				
18.08	18.54	MINING		1.50	3,4,12-24	12000	-
18.54	19.05	RING INSTALLATION	1911				
19.05	19.55	MINING		1.50	3,4,12-24	11500	-
19.55	20.05	RING INSTALLATION	1912				
20.05	20.20	MINING		-	-	-	INCOMPLETE PUSH
20.20	20.50	LUNCH					
20.50	21.23	MINING		1.40	3,4,12-24	12000	COMPLETED PUSH
21.23	21.50	DELAY					NO.1 BELT SLIPPING(RE-SET ALL BELTS)
21.50	23.40	DELAY					UNABLE TO RE-SET NO.4 BELT DRIVE, ELECTRICIAN CALLED IN.
23.40	24.00	-- SHIFT CHANGE------					TROUBLE ISOLATED TO THE "BELMOS" REPAIR CARRIED OUT DURING SHIFT CHANGE

Notes: TOTAL OF 9 MINUTES DURING 16.00-24.00 SHIFT TO INSTALL SPACERS(INCLUDED WITH MINING TIME)

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 01,1984
Chainage :Start 2857.71 m
End 2882.91 m
Advance for day 25.20 m

File Name: DY11-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.16	-- SHIFT CHANGE------					
0.16	1.05	DELAY					ELECTRICAL TROUBLE (LOOSE WIRES IN BELMOS SWITCH)
1.05	1.10	MINING		0.10	3,4,11-24	11000	COMPLETED PUSH
1.10	1.20	RING INSTALLATION	1913				
1.20	1.50	MINING		-	-	-	INCOMPLETE PUSH
1.50	1.55	DELAY					EXPAND RING #1912
1.55	2.15	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
2.15	2.25	RING INSTALLATION	1914				
2.25	2.50	MINING		-	-	-	INCOMPLETE PUSH
2.50	2.55	RING INSTALLATION					EXPAND RING #1913
2.55	3.15	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
3.15	3.25	RING INSTALLATION	1915				
3.25	3.45	MINING		-	-	-	INCOMPLETE PUSH
3.45	3.50	DELAY					EXPAND RING #1914
3.50	4.15	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
4.15	4.25	RING INSTALLATION	1916				
4.25	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.20	MINING		-	-	-	INCOMPLETE PUSH
5.20	5.25	DELAY					EXPAND RING #1915
5.25	5.45	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
5.45	5.55	RING INSTALLATION	1917				
5.55	6.20	MINING		-	-	-	INCOMPLETE PUSH
6.20	6.25	DELAY					EXPAND RING #1916
6.25	6.45	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
6.45	6.55	RING INSTALLATION	1918				
6.55	7.20	MINING		-	-	-	INCOMPLETE PUSH
7.20	7.25	DELAY					EXPAND RING #1917
7.25	7.45	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
7.45	8.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #20,26,42A,43B.
8.00	11.40	MAINTENANCE		-	-	-	CONTINUE CUTTER CHANGE & SHIFT CHANGE
							REPAIR HYDRLC. LEAK IN NO.15 MOTOR
							ASSORTED MACHINE MAINTENANCE
11.40	12.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 01,1984
Chainage :Start 2857.71 m
End 2882.91 m
Advance for day 25.20 m

File Name: DY11-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
12.30	12.44	RING INSTALLATION	1919				
12.44	13.16	MINING		-	-	-	INCOMPLETE PUSH
13.16	13.19	DELAY					INSTALL SPACER BLOCKS
13.19	13.32	MINING		1.50	3-13,21-24	13000	COMPLETED PUSH
13.32	13.41	RING INSTALLATION	1920				
13.41	14.07	MINING		-	-	-	INCOMPLETE PUSH
14.07	14.10	DELAY					INSTALL SPACER BLOCKS
14.10	14.33	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
14.33	14.47	RING INSTALLATION	1921				
14.47	15.06	MINING		-	-	-	INCOMPLETE PUSH
15.06	15.09	DELAY					INSTALL SPACER BLOCKS
15.09	15.35	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
15.35	15.43	RING INSTALLATION	1922				
15.43	16.00	MINING		0.60	3,4,13-24	14000	INCOMPLETE PUSH & SHIFT CHANGE
16.00	16.37	MINING		0.90	3,4.5,12-24	12000	COMPLETED PUSH
16.37	16.47	RING INSTALLATION	1923				
16.47	17.10	MINING		-	-	-	INCOMPLETE PUSH
17.10	17.16	DELAY					PRIMARY CONVEYOR STOPPED
17.16	17.46	MINING		1.50	3,4,12-24	11500	COMPLETED PUSH
17.46	17.58	RING INSTALLATION	1924				
17.58	18.45	MINING		1.50	3,4,12-24	11500	-
18.45	18.56	RING INSTALLATION	1925				
18.56	19.44	MINING		1.50	3,4,11,12, 16-24	11500	-
19.44	19.56	RING INSTALLATION	1926				
19.56	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.40	LUNCH					
20.40	21.17	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
21.17	21.29	RING INSTALLATION	1927				
21.29	22.15	MINING		1.50	3,4,8,10,12-16 ,18,20-24	11500	-
22.15	22.26	RING INSTALLATION	1928				
22.26	23.11	MINING		1.50	3,4,8,10,12-16 ,18,20-24	12500	-
23.11	23.22	RING INSTALLATION	1929				
23.22	24.00	MINING		1.10	3,4,12-24	11000	INCOMPLETE PUSH & SHIFT CHANGE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 02,1984 File Name: DY11-02A
Chainage :Start 2882.91 m
End 2911.41 m Project No: 831-6014
Advance for day 28.50 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.17	MINING		0.40	3,4,13-24	10000	COMPLETED PUSH
0.17	0.30	RING INSTALLATION	1930				
0.30	0.50	MINING		-	-	-	INCOMPLETE PUSH
0.50	0.53	DELAY					EXPAND RING #1929
0.53	1.15	MINING		1.50	3,4,12-24	10000	COMPLETED PUSH
1.15	1.27	RING INSTALLATION	1931				
1.27	1.45	MINING					INCOMPLETE PUSH
1.45	1.48	DELAY					EXPAND RING #1930
1.48	2.13	MINING		1.50	3,4,13-24	10000	COMPLETED PUSH
2.13	2.25	RING INSTALLATION	1932				
2.25	2.50	MINING		-	-	-	INCOMPLETE PUSH
2.50	2.53	DELAY					EXPAND RING #1931
2.53	3.14	MINING		1.50	3,4,12-24	10000	COMPLETED PUSH
3.14	3.26	RING INSTALLATION	1933				
3.26	3.50	MINING		-	-	-	INCOMPLETE PUSH
3.50	3.53	DELAY					EXPAND RING #1932
3.53	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.48	MINING		1.50	3,4,12-24	10000	COMPLETED PUSH
4.48	5.00	RING INSTALLATION	1934				
5.00	5.25	MINING		-	-	-	INCOMPLETE PUSH
5.25	5.28	DELAY					EXPAND RING #1933
5.28	5.50	MINING		1.50	3,4,13-24	10000	COMPLETED PUSH
5.50	6.02	RING INSTALLATION	1935				
6.02	6.27	MINING		-	-	-	INCOMPLETE PUSH
6.27	6.30	DELAY					EXPAND RING #1934
6.30	6.50	MINING		1.50	3,4,11-24	10000	COMPLETED PUSH
6.50	7.00	RING INSTALLATION	1936				
7.00	7.25	MINING		-	-	-	INCOMPLETE PUSH
7.25	7.28	DELAY					EXPAND RING #1935
7.28	7.43	MINING		1.50	3,4,11-24	10000	COMPLETED PUSH
7.43	7.53	RING INSTALLATION	1937				
7.53	8.00	MINING		0.20	3,4,12-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.35	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 02,1984
Chainage :Start 2882.91 m
End 2911.41 m
Advance for day 28.50 m

File Name: DY11-02A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.35	8.47	DELAY					INSTALL SPACER BLOCKS
8.47	8.53	MINING		1.30	3,4,13-24	12000	COMPLETED PUSH
8.53	9.07	RING INSTALLATION	1938				
9.07	9.13	MINING		-	-	-	INCOMPLETE PUSH
9.13	9.18	DELAY					T.B.M. KICKING OUT(5 & 6 CONTACTERS)
9.18	9.40	MINING		-	-	-	INCOMPLETE PUSH
9.40	9.43	DELAY					INSTALL SPACER BLOCKS
9.43	10.00	MINING		-	-	-	INCOMPLETE PUSH
10.00	10.10	DELAY					PRIMARY BELT JAMMED WITH MUCK
10.10	10.17	DELAY					BELT SYSTEM DOWN (RESET FROM SURFACE)
10.17	10.23	MINING		1.50	3-8,13-16, 21-24	13000	COMPLETED PUSH
10.23	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #17,19,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.00	14.08	DELAY					START NO.4 BELT
14.08	14.18	RING INSTALLATION	1939				
14.18	14.50	MINING		-	-	-	INCOMPLETE PUSH
14.50	14.53	DELAY					INSTALL SPACER BLOCKS
14.53	15.04	MINING		1.50	3-16,21-24	15000	COMPLETED PUSH
15.04	15.14	RING INSTALLATION	1940				
15.14	15.45	MINING		-	-	-	INCOMPLETE PUSH
15.45	15.48	DELAY					INSTALL SPACER BLOCKS
15.48	16.00	MINING		1.50	3-16,21-24	15000	COMPLETED PUSH
		-- SHIFT CHANGE------					
16.00	16.08	RING INSTALLATION	1941				
16.08	16.54	MINING		1.50	3,4,11-24	13500	-
16.54	17.05	RING INSTALLATION	1942				
17.05	17.53	MINING		1.50	3,4,11-24	13000	-
17.53	18.04	RING INSTALLATION	1943				
18.04	18.55	MINING		1.50	3,4,12-24	13000	-
18.55	19.06	RING INSTALLATION	1944				
19.06	19.56	MINING		1.50	3,4.5,13-24	14000	-
19.56	20.06	RING INSTALLATION	1945				
20.06	20.25	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 02,1984
Chainage :Start 2882.91 m
End 2911.41 m
Advance for day 28.50 m

File Name: DY11-02A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
20.25	20.55	LUNCH					
20.55	21.25	MINING		1.50	3,4.5,12-24	13000	COMPLETED PUSH
21.25	21.37	RING INSTALLATION	1946				
21.37	22.26	MINING		1.50	12-24	13500	-
22.26	22.38	RING INSTALLATION	1947				
22.38	23.23	MINING		1.50	3,4.5,13-24	12500	-
23.23	23.33	RING INSTALLATION	1948				
23.33	24.00	MINING		1.10	3,4,13-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 03,1984
Chainage :Start 2911.41 m
End 2924.25 m
Advance for day 12.84 m

File Name: DY11-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.16	MINING		0.40	3-8,12-24	10000	COMPLETED PUSH
0.16	0.30	RING INSTALLATION	1949				
0.30	0.50	MINING		-	-	-	INCOMPLETE PUSH
0.50	0.53	DELAY					EXPAND RING #1948
0.53	1.15	MINING		1.50	3-8,12-24	11000	COMPLETED PUSH
1.15	1.27	RING INSTALLATION	1950				
1.27	1.47	MINING		-	-	-	INCOMPLETE PUSH
1.47	1.50	DELAY					EXPAND RING #1949
1.50	2.10	MINING		1.50	3-8,12-24	11000	COMPLETED PUSH
2.10	2.20	RING INSTALLATION	1951				
2.20	2.40	MINING		-	-	-	INCOMPLETE PUSH
2.40	2.43	DELAY					EXPAND RING #1950
2.43	3.05	MINING		1.50	3-8,12-24	11000	COMPLETED PUSH
3.05	3.17	RING INSTALLATION	1952				
3.17	3.37	MINING		-	-	-	INCOMPLETE PUSH
3.37	3.40	DELAY					EXPAND RING #1951
3.40	4.00	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
4.00	4.10	RING INSTALLATION	1953				
4.10	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.03	DELAY					EXPAND RING #1952
5.03	5.28	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
5.28	5.40	RING INSTALLATION	1954				
5.40	5.50	DELAY					REPAIR PRIMARY BELT (SPLICE TORN)
5.50	6.10	MINING		-	-	-	INCOMPLETE PUSH
6.10	6.13	DELAY					EXPAND RING #1953
6.13	6.35	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
6.35	6.45	RING INSTALLATION	1955				
6.45	7.05	MINING		-	-	-	INCOMPLETE PUSH
7.05	7.08	DELAY					EXPAND RING #1954
7.08	7.28	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
7.28	7.38	RING INSTALLATION	1956				
7.38	8.00	MINING		-	-	-	INCOMPLETE PUSH
8.00	8.03	DELAY					EXPAND RING #1955
8.03	8.23	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 03,1984
Chainage :Start 2911.41 m
End 2924.25 m
Advance for day 12.84 m

File Name: DY11-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.23	8.35	RING INSTALLATION	1957				
8.35	9.05	MINING		0.67	3,4,12-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 05,1984 File Name: DY11-05A
Chainage :Start 2924.32 m REVISED
End 2937.22 m REVISED Project No: 831-6014
Advance for day 12.90 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.16	-- SHIFT CHANGE------					
8.16	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #8,16,42B,43A.
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.40	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.40	13.50	MINING		-	-	-	INCOMPLETE PUSH
13.50	14.08	DELAY					T.B.M. CUTTING OUT (OIL TEMP LOW)
14.08	14.15	MINING		-	-	-	INCOMPLETE PUSH
14.15	14.20	DELAY					EXPAND RING #1957
14.20	14.25	MINING		-	-	-	INCOMPLETE PUSH
14.25	14.35	DELAY					SECONDARY BELT SLIPPING
14.35	14.40	MINING		0.90	3,4,11-24	13500	COMPLETED PUSH
14.40	14.50	RING INSTALLATION	1958				
14.50	15.20	MINING		-	-	-	INCOMPLETE PUSH
15.20	15.25	DELAY					EXPAND RING #1958
15.25	15.45	MINING		1.50	3,4,11-24	13500	COMPLETED PUSH
15.45	16.00	RING INSTALLATION	1959				
		-- SHIFT CHANGE------					
16.00	16.22	MINING		-	-	-	INCOMPLETE PUSH
16.22	16.26	DELAY					INSTALL MESH
16.26	16.42	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
16.42	16.52	RING INSTALLATION	1960				
16.52	17.07	MINING		-	-	-	INCOMPLETE PUSH
17.07	17.10	DELAY					INSTALL MESH
17.10	17.36	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
17.36	17.47	RING INSTALLATION	1961				
17.47	18.12	MINING		-	-	-	INCOMPLETE PUSH
18.12	18.45	DELAY					BELT SYSTEM DOWN (NO.1 BELT SLIPPING)
18.45	19.00	MINING		-	-	-	INCOMPLETE PUSH
19.00	19.15	DELAY					SCNDRY BELT LOOSE, NO ADJUSTMENT LEFT
19.15	19.24	MINING		1.50	3,4,9-24	11000	COMPLETED PUSH
19.24	19.35	RING INSTALLATION	1962				
19.35	19.55	MINING		-	-	-	INCOMPLETE PUSH
19.55	20.25	LUNCH					
20.25	20.50	MINING		1.50	3,4,9-24	11000	COMPLETED PUSH

Notes:

Donkin-Morien Developement Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 05,1984 File Name: DY11-05A
Chainage :Start 2924.32 m REVISED
End 2937.22 m REVISED Project No: 831-6014
Advance for day 12.90 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.50	21.05	DELAY					NO POWER AT T.B.M.(TRANSFORMERS ON SKID
21.05	21.16	RING INSTALLATION	1963				TRIPPED OFF, NEW OUT STATION PROBLEM)
21.16	21.56	MINING		1.50	3,4,13-24	11000	-
21.56	22.10	RING INSTALLATION	1964				
22.10	22.20	DELAY					TROUBLE FITTING PUSH RING
22.20	23.01	MINING		1.50	3,4,13-24	11000	-
23.01	23.12	RING INSTALLATION	1965				
23.12	23.50	MINING		-	-	-	INCOMPLETE PUSH
23.50	23.55	DELAY					NO POWER @ T.B.M.(TRANS. TRIPPED OFF)
23.55	24.00	MINING		1.50	3,4,13-24	11000	COMPLETED PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 06,1984
Chainage :Start 2937.22 m
End 2963.22 m
Advance for day 26.00 m

File Name: DY11-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.12	RING INSTALLATION	1966				
0.12	1.03	MINING		1.50	3-8,12,14, 18-24	10500	-
1.03	1.14	RING INSTALLATION	1967				
1.14	2.04	MINING		1.50	3-8,12,14, 18-24	10000	-
2.04	2.16	RING INSTALLATION	1968				
2.16	2.53	MINING		-	-	-	INCOMPLETE PUSH
2.53	3.18	DELAY					TAIL ROLLER PLUGGED (MUCK & RE-ALIGN)
3.18	3.27	MINING		1.50	3-8,12,14, 18-24	9500	COMPLETED PUSH
3.27	3.40	RING INSTALLATION	1969				
3.40	4.20	MINING		-	-	-	INCOMPLETE PUSH
4.20	4.50	LUNCH					
4.50	5.05	MINING		1.50	3,4,11-24	10000	COMPLETED PUSH
5.05	5.17	RING INSTALLATION	1970				
5.17	6.08	MINING		1.50	3,4,11-24	9500	-
6.08	6.20	RING INSTALLATION	1971				
6.20	6.30	DELAY					RESPLICE PRIMARY CONVEYOR(BAD SPLICE)
6.30	7.21	MINING		1.50	3,4,11-24	9500	-
7.21	7.32	RING INSTALLATION	1972				
7.32	8.00	MINING		0.90	3,4,13-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.20	MINING		0.60	3,4,11-24	11000	COMPLETED PUSH
8.20	8.33	RING INSTALLATION	1973				
8.33	9.00	MINING		-	-	-	INCOMPLETE PUSH
9.00	9.05	DELAY					EXPAND RING #1972
9.05	9.30	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
9.30	9.43	RING INSTALLATION	1974				
9.43	10.15	MINING		-	-	-	INCOMPLETE PUSH
10.15	10.20	DELAY					EXPAND RING #1973
10.20	10.37	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
10.37	10.47	RING INSTALLATION	1975				
10.47	11.15	MINING		-	-	-	INCOMPLETE PUSH
11.15	11.20	DELAY					EXPAND RING #1974

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 06,1984 File Name: DY11-06A
Chainage :Start 2937.22 m
End 2963.22 m Project No: 831-6014
Advance for day 26.00 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
11.20	11.45	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
11.45	12.00	RING INSTALLATION	1976				
12.00	12.30	LUNCH					
12.30	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #28,39,42A,43B. ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	16.16	MAINTENANCE		-	-	-	COMPLETE WORK ON PRIMARY BELT
16.15	16.31	DELAY					ADJUST PRIMARY & SCNDRY BELTS(SLIPPING)
16.31	17.19	MINING		1.50	3-8,13-24	10000	-
17.19	17.30	RING INSTALLATION	1977				
17.30	18.14	MINING		1.50	3-8,13-24	10000	-
18.14	18.25	RING INSTALLATION	1978				
18.25	19.09	MINING		1.50	3-8,13-24	10000	-
19.09	19.20	RING INSTALLATION	1979				
19.20	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.41	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
20.41	20.53	RING INSTALLATION	1980				
20.53	21.45	MINING		1.50	3-8,13-24	10000	-
21.45	21.54	RING INSTALLATION	1981				
21.54	22.42	MINING		1.50	3-8,13-24	10000	-
22.42	22.52	RING INSTALLATION	1982				
22.52	23.38	MINING		1.50	3-8,13-24	10000	-
23.38	23.47	RING INSTALLATION	1983				
23.47	24.00	MINING		0.50	3-8,13-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 7,1984
Chainage :Start 2963.22 m
End 2985.62 m
Advance for day 22.40 m

File Name: DY11-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.30	MINING		-	-	-	INCOMPLETE PUSH
0.30	0.33	DELAY		-	-	-	INSTALL SPACER BLOCKS
0.33	0.40	MINING		1.00	3,4,13-24	11000	COMPLETED PUSH
0.40	0.53	RING INSTALLATION	1984				
0.53	1.15	MINING		-	-	-	INCOMPLETE PUSH
1.15	4.00	MAINTENANCE		-	-	-	EXTEND #4 BELT
							CHANGED CUTTERS #43A,42B,8,34.
4.00	4.30	LUNCH					
4.30	4.55	MAINTENANCE		-	-	-	CONTINUED AS ABOVE
4.55	5.05	MINING		-	-	-	INCOMPLETE PUSH
5.05	5.08	DELAY		-	-	-	INSTALL SPACER BLOCKS
5.08	5.24	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
5.24	5.35	RING INSTALLATION	1985				
5.35	6.01	MINING		-	-	-	INCOMPLETE PUSH
6.01	6.03	DELAY		-	-	-	INSTALL SPACER BLOCKS
6.03	6.22	MINING		1.50	3-12,17-24	13000	COMPLETED PUSH
6.22	6.31	RING INSTALLATION	1986				
6.31	6.58	MINING		-	-	-	INCOMPLETE PUSH
6.58	7.01	DELAY		-	-	-	INSTALL SPACER BLOCKS
7.01	7.26	MINING		1.50	3-12,17-24	13000	COMPLETED PUSH
7.26	7.36	RING INSTALLATION	1987				
7.36	8.00	MINING		0.70	3-12,17-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE--					
8.00	8.20	MINING		-	-	-	INCOMPLETE PUSH
8.20	8.35	DELAY					SECONDARY CONVEYOR CHUTE PLUGGED
8.35	8.45	MINING		0.80	3-8,16-24	15000	COMPLETED PUSH
8.45	8.55	RING INSTALLATION	1988				
8.55	9.30	MINING		-	-	-	INCOMPLETE PUSH
9.30	9.35	DELAY					EXPAND RING #1987
9.35	9.55	MINING		1.50	3,4,12-24	15000	COMPLETED PUSH
9.55	10.05	RING INSTALLATION	1989				
10.05	10.40	MINING		-	-	-	INCOMPLETE PUSH
10.40	10.43	DELAY					EXPAND RING #1988
10.43	11.05	MINING		1.50	3,4,11-24	15000	COMPLETED PUSH
11.05	11.17	RING INSTALLATION	1990				
11.17	11.47	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 06,1984
Chainage :Start 2937.22 m
End 2963.22 m
Advance for day 26.00 m

File Name: DY11-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
11.20	11.45	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
11.45	12.00	RING INSTALLATION	1976				
12.00	12.30	LUNCH					
12.30	16.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #28,39,42A,43B. ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					
16.00	16.16	MAINTENANCE		-	-	-	COMPLETE WORK ON PRIMARY BELT
16.15	16.31	DELAY					ADJUST PRIMARY & SCNDRY BELTS(SLIPPING)
16.31	17.19	MINING		1.50	3-8,13-24	10000	-
17.19	17.30	RING INSTALLATION	1977				
17.30	18.14	MINING		1.50	3-8,13-24	10000	-
18.14	18.25	RING INSTALLATION	1978				
18.25	19.09	MINING		1.50	3-8,13-24	10000	-
19.09	19.20	RING INSTALLATION	1979				
19.20	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.41	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
20.41	20.53	RING INSTALLATION	1980				
20.53	21.45	MINING		1.50	3-8,13-24	10000	-
21.45	21.54	RING INSTALLATION	1981				
21.54	22.42	MINING		1.50	3-8,13-24	10000	-
22.42	22.52	RING INSTALLATION	1982				
22.52	23.38	MINING		1.50	3-8,13-24	10000	-
23.38	23.47	RING INSTALLATION	1983				
23.47	24.00	MINING		0.50	3-8,13-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 7,1984
Chainage :Start 2963.22 m
End 2985.62 m
Advance for day 22.40 m

File Name: DY11-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
11.47	11.52	DELAY					EXPAND RING @1989
11.52	12.22	LUNCH					
12.22	14.15	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
14.15	15.25	DELAY					REPLACE BROKEN 'O' RING ON OIL FILTER (NEW ONE FROM SURFACE)
15.25	15.45	MINING		1.50	3,4,12-24	15000	COMPLETED PUSH
15.45	15.55	RING INSTALLATION	1991				
15.55	16.00	MINING		0.20	3,4,11-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.46	MINING		1.30	3,4,11-24	15000	COMPLETED PUSH
16.46	17.02	RING INSTALLATION	1992				
17.02	17.53	MINING		1.50	3,4,7,8.5,9-16 18,20-24	10500	-
17.53	18.06	RING INSTALLATION	1993				
18.06	18.58	MINING		1.50	3,4,7,8.5,9-16 18,20-24	11000	-
18.58	19.14	RING INSTALLATION	1994				
19.14	20.00	MINING		1.50	3,4,7,8.5,9-16 18,20-24	11000	-
20.00	20.12	RING INSTALLATION	1995				
20.12	20.30	MINING		-	-	-	INCOMPLETE PUSH
20.30	21.00	LUNCH					
21.00	21.34	MINING		1.50	3,4,12-16,18, 20-24	13500	COMPLETED PUSH
21.34	21.48	RING INSTALLATION	1996				
21.48	22.04	MINING		-	-	-	INCOMPLETE PUSH
22.04	22.10	DELAY					INSTALL MESH
22.10	22.38	MINING		1.50	3,4,12-16,18, 20-24	12500	COMPLETED PUSH
22.38	22.49	RING INSTALLATION	1997				
22.49	23.06	MINING		-	-	-	INCOMPLETE PUSH
23.06	23.10	DELAY					INSTALL MESH
23.10	23.40	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
23.40	23.51	RING INSTALLATION	1998				
23.51	24.00	MINING		0.40	3-8,13-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 08,1984 File Name: DY11-08A
Chainage :Start 2982.62 m
End 3007.22 m Project No: 831-6014
Advance for day 24.60 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.37	MINING		1.10	3,4,13-24	12000	COMPLETED PUSH
0.37	0.47	RING INSTALLATION	1999				
0.47	1.16	MINING		-	-	-	INCOMPLETE PUSH
1.16	1.19	DELAY					INSTALL SPACERS
1.19	1.37	MINING		1.50	3,4,13-24	12500	COMPLETED PUSH
1.37	1.46	RING INSTALLATION	2000				
1.46	1.52	MINING		-	-	-	INCOMPLETE PUSH
1.52	2.06	DELAY					PRIMARY CONVEYOR STOPPED(MUCK IN HEAD)
2.06	2.21	MINING		-	-	-	INCOMPLETE PUSH
2.21	2.23	DELAY					
2.23	2.49	MINING		1.50	3,4,11,13-24	13000	COMPLETED PUSH
2.49	2.59	RING INSTALLATION	2001				
2.59	3.10	MINING		-	-	-	INCOMPLETE PUSH
3.10	3.13	DELAY					SECONDARY CONVEYOR TRIPPED OUT
3.13	3.27	MINING		-	-	-	INCOMPLETE PUSH
3.27	3.29	DELAY					INSTALL SPACERS
3.29	4.02	MINING		1.50	3-8,12,17-24	13000	COMPLETED PUSH
4.02	4.15	RING INSTALLATION	2002				
4.15	4.45	LUNCH					
4.45	5.16	MINING		-	-	-	INCOMPLETE PUSH
5.16	5.18	DELAY					INSTALL SPACERS
5.18	5.30	MINING		-	-	-	INCOMPLETE PUSH
5.30	5.36	DELAY					PRIMARY CONVEYOR SLIPPING
5.36	5.53	MINING		1.50	3-8,17-24	15000	COMPLETED PUSH
5.53	6.06	RING INSTALLATION	2003				
6.06	6.28	MINING		-	-	-	INCOMPLETE PUSH
6.28	6.30	DELAY					INSTALL SPACERS
6.30	6.56	MINING		1.50	3-8,17-24	11000	COMPLETED PUSH
6.56	7.07	RING INSTALLATION	2004				
7.07	7.23	MINING		-	-	-	INCOMPLETE PUSH
7.23	7.31	DELAY					MEASURE FOR SPECIAL SET OF RINGS
7.31	7.40	MINING		-	-	-	INCOMPLETE PUSH
7.40	7.42	DELAY					INSTALL SPACERS
7.42	8.00	MINING		1.30	3,4,11-24	13500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 08,1984
Chainage :Start 2982.62 m
End 3007.22 m
Advance for day 24.60 m

File Name: DY11-08A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.00	8.08	MINING		0.20	3,4,12-24	15000	COMPLETED PUSH
8.08	8.20	RING INSTALLATION	2005				
8.20	8.45	MINING		-	-	-	INCOMPLETE PUSH
8.45	12.00	MAINTENANCE & DRILL'G					CHANGED CUTTERS #22,30,42B,43A.
							ASSORTED MACHINE MAINTENANCE
							DRILL INSTRUMENT HOLE
12.00	12.30	LUNCH					
12.30	14.30	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.30	15.00	DELAY					SECONDARY BELT SLIPPING
15.00	15.30	MINING		1.50	3,4,12-24	15000	COMPLETED PUSH
15.30	15.45	RING INSTALLATION	2006				
15.45	16.00	MINING		0.40	3,4,11-24	15000	INCOMPLETE PUSH
16.00	16.20	-- SHIFT CHANGE------					WALK FROM DIESEL GARAGE
16.20	16.37	MINING		-	-	-	INCOMPLETE PUSH
16.37	16.42	DELAY					INSTALL MESH
16.42	17.12	MINING		1.10	3,4,13-24	13000	COMPLETED PUSH
17.12	17.31	RING INSTALLATION	2007				
17.31	17.38	MINING		-	-	-	INCOMPLETE PUSH
17.38	17.45	DELAY					CHANGE HYDRLC. HOSE (LOVAT)
17.45	18.36	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
18.36	18.48	RING INSTALLATION	2008				
18.48	19.37	MINING		1.50	3,4,13-24	13000	-
19.37	19.48	RING INSTALLATION	2009				
19.48	20.08	MINING		-	-	-	INCOMPLETE PUSH
20.08	20.38	LUNCH					
20.38	21.04	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
21.04	21.22	RING INSTALLATION	2010				(SPECIAL SET)
21.22	22.10	MINING		1.50	3,4,13-24	13000	-
22.10	22.26	RING INSTALLATION	2011				
22.26	23.14	MINING		1.50	3,4,13-24	13000	-
23.14	23.23	RING INSTALLATION	2012				
23.23	24.00	MINING		1.00	3,4,13-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 09,1984 File Name: DY11-09A
Chainage :Start 3007.22 m
End 3036.42 m Project No: 831-6014
Advance for day 29.20 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.16	MINING		0.50	3,4,13-24	13000	COMPLETED PUSH
0.16	0.43	DELAY					HYDRLC. HOSE PLUGGED(NO.18 PUSH CYL)
0.43	0.57	RING INSTALLATION	2013				
0.57	1.21	MINING		-	-	-	INCOMPLETE PUSH
1.21	1.23	DELAY					INSTALL SPACERS
1.23	1.46	MINING		1.50	3-8,13-24	12500	COMPLETED PUSH
1.46	2.00	RING INSTALLATION	2014				
2.00	2.23	MINING		-	-	-	INCOMPLETE PUSH
2.23	2.25	DELAY					INSTALL SPACERS
2.25	2.43	MINING		1.50	3-8,13-24	12500	COMPLETED PUSH
2.43	2.54	RING INSTALLATION	2015				
2.54	3.17	MINING		-	-	-	INCOMPLETE PUSH
3.17	3.19	DELAY					INSTALL SPACERS
3.19	3.38	MINING		1.50	3-8,13-24	13000	COMPLETED PUSH
3.38	3.48	RING INSTALLATION	2016				
3.48	4.06	MINING		-	-	-	INCOMPLETE PUSH
4.06	4.08	DELAY					INSTALL SPACERS
4.08	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.14	MINING		1.50	3,4,11-24	13500	COMPLETED PUSH
5.14	5.25	RING INSTALLATION	2017				
5.25	5.48	MINING		-	-	-	INCOMPLETE PUSH
5.48	5.50	DELAY					INSTALL SPACERS
5.50	6.09	MINING		1.50	3,4,11,13-24	14500	COMPLETED PUSH
6.09	6.22	RING INSTALLATION	2018				
6.22	6.56	MINING		-	-	-	INCOMPLETE PUSH
6.56	6.57	DELAY					INSTALL SPACERS
6.57	7.19	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
7.19	7.31	RING INSTALLATION	2019				
7.31	7.58	MINING		1.00	3,4,11-24	14500	INCOMPLETE PUSH
7.58	8.00	DELAY					INSTALL SPACERS
		-- SHIFT CHANGE------					
8.00	8.17	MINING		0.50	3,4,11-24	14000	COMPLETED PUSH
8.17	8.30	RING INSTALLATION	2020				
8.30	9.00	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 09,1984
Chainage :Start 3007.22 m
End 3036.42 m
Advance for day 29.20 m

File Name: DY11-09A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
9.00	9.03	DELAY					EXPAND RING #2019
9.03	9.20	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
9.20	9.30	RING INSTALLATION	2021				
9.30	10.00	MINING		-	-	-	INCOMPLETE PUSH
10.00	10.03	DELAY					EXPAND RING #2020
10.03	10.20	MINING		1.50	3,4,11-24	14000	COMPLETED PUSH
10.20	10.30	RING INSTALLATION	2022				
10.30	11.00	MINING		-	-	-	INCOMPLETE PUSH
11.00	11.03	DELAY					EXPAND RING #2021
11.03	11.20	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
11.20	11.30	RING INSTALLATION	2023				
11.30	11.55	MINING		-	-	-	INCOMPLETE PUSH
11.55	12.00	MAINTENANCE		-	-	-	PULL BACK T.B.M. TO CHANGE CUTTERS
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE					CHANGED CUTTERS #38,41,42A,43B. ASSORTED MACHINE MAINTENANCE
15.40	16.00	MINING		1.20	3,4,11-24	14000	COMPLETED PUSH
		-- SHIFT CHANGE------					
16.00	16.16	MINING		0.30	3,4,13-24	14000	COMPLETED PUSH
16.16	16.31	RING INSTALLATION	2024				
16.31	16.50	MINING		-	-	-	INCOMPLETE PUSH
16.50	16.53	DELAY					INSTALL MESH
16.53	17.14	MINING		1.50	3,4,13-24	14000	COMPLETED PUSH
17.14	17.25	RING INSTALLATION	2025				
17.25	17.44	MINING		-	-	-	INCOMPLETE PUSH
17.44	17.46	DELAY					INSTALL MESH
17.46	18.07	MINING		1.50	3,4,13-24	14000	COMPLETED PUSH
18.07	18.20	RING INSTALLATION	2026				
18.20	18.40	MINING		-	-	-	INCOMPLETE PUSH
18.40	18.42	DELAY					INSTALL MESH
18.42	19.00	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
19.00	19.12	RING INSTALLATION	2027				
19.12	19.26	MINING		-	-	-	INCOMPLETE PUSH
19.26	19.28	DELAY					INSTALL MESH
19.28	19.51	MINING		1.50	3,4,13-16, 21-24	11000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 09,1984 — File Name: DY11-09A
Chainage :Start 3007.22 m
End 3036.42 m — Project No: 831-6014
Advance for day 29.20 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.51	20.04	RING INSTALLATION	2028				
20.04	20.10	MINING		-	-	-	INCOMPLETE PUSH
20.10	20.40	LUNCH					
20.40	20.50	MINING		-	-	-	INCOMPLETE PUSH
20.50	20.52	DELAY					INSTALL MESH
20.52	21.20	MINING		1.50	3,4,13-16, 21-24	11000	COMPLETED PUSH
21.20	21.31	RING INSTALLATION	2029				
21.31	21.47	MINING		-	-	-	INCOMPLETE PUSH
21.47	21.49	DELAY					INSTALL MESH
21.49	22.08	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
22.08	22.18	RING INSTALLATION	2030				
22.18	22.33	MINING		-	-	-	INCOMPLETE PUSH
22.33	22.35	DELAY					INSTALL MESH
22.35	22.54	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
22.54	23.06	RING INSTALLATION	2031				
23.06	23.26	MINING		-	-	-	INCOMPLETE PUSH
23.26	23.28	DELAY					INSTALL MESH
23.28	23.45	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
23.45	23.55	RING INSTALLATION	2032				
23.55	24.00	MINING		0.20	3,4,13-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 10,1984 File Name: DY11-10A
Chainage :Start 3036.42 m
End 3046.64 m Project No: 831-6014
Advance for day 10.22 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.22	MINING		-	-	-	INCOMPLETE PUSH
0.22	0.23	DELAY					INSTALL SPACERS
0.23	0.36	MINING		1.30	3-8,13-24	14500	COMPLETED PUSH
0.36	0.47	RING INSTALLATION	2033				
0.47	1.09	MINING		-	-	-	INCOMPLETE PUSH
1.09	1.11	DELAY					INSTALL SPACERS
1.11	1.27	MINING		1.50	3-8,13-24	14500	COMPLETED PUSH
1.27	1.37	RING INSTALLATION	2034				
1.37	2.01	MINING		-	-	-	INCOMPLETE PUSH
2.01	2.03	DELAY					INSTALL SPACERS
2.03	2.19	MINING		1.50	3-8,11-20	14000	COMPLETED PUSH
2.19	2.29	RING INSTALLATION	2035				
2.29	2.41	MINING		-	-	-	INCOMPLETE PUSH
2.41	2.44	DELAY					INSTALL MESH
2.44	2.47	MINING		-	-	-	INCOMPLETE PUSH
2.47	2.49	DELAY					INSTALL SPACERS
2.49	3.16	MINING		1.50	3,4,8,10,12-20	15000	COMPLETED PUSH
3.16	3.33	RING INSTALLATION	2036				
3.33	4.01	MINING		-	-	-	INCOMPLETE PUSH
4.01	4.04	DELAY					INSTALL SPACERS
4.04	4.30	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
4.30	5.00	LUNCH					
5.00	5.11	RING INSTALLATION	2037				
5.11	5.35	MINING		-	-	-	INCOMPLETE PUSH
5.35	5.37	DELAY					INSTALL SPACERS
5.37	5.58	MINING		1.50	3-8,17-24	11500	COMPLETED PUSH
5.58	6.09	RING INSTALLATION	2038				
6.09	6.34	MINING		-	-	-	INCOMPLETE PUSH
6.34	6.36	DELAY					INSTALL SPACERS
6.36	6.48	MINING		1.50	3,4,13-24	12500	COMPLETED PUSH
6.48	6.58	RING INSTALLATION	2039				
6.58	7.01	MINING		-	-	-	INCOMPLETE PUSH
7.01	7.40	DELAY					NO.1 BELT DOWN
7.40	8.00	-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: NOVEMBER 13,1984
Chainage: Start 3046.64 m
End 3054.01 m
Advance for day 7.37 m

File Name: DY11-13A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND & REMEMBERANCE DAY(NOV.12/84)
8.00	8.18	-- SHIFT CHANGE------					
8.18	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #16,24,31,42,43.
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.05	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.05	13.16	DELAY					TIGHTEN SECONDARY CONVEYOR
13.16	13.23	MINING		-	-	-	INCOMPLETE PUSH
13.23	13.43	DELAY					SECONDARY CONVEYOR DOWN(RETIGHTEN BELT)
13.43	14.45	MINING		1.37	3-8,11-24	15000	COMPLETED PUSH
14.45	14.56	RING INSTALLATION	2040				
14.56	15.38	MINING		1.50	3-8,13-24	11500	-
15.38	15.49	RING INSTALLATION	2041				
15.49	16.00	MINING		0.50	3-8,13-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.25	MINING		-	-	-	INCOMPLETE PUSH
16.25	16.28	DELAY					EXPAND RING #2040
16.28	16.40	MINING		1.00	3-8,12-24	11000	COMPLETED PUSH
16.40	16.50	RING INSTALLATION	2042				
16.50	17.15	MINING		-	-	-	INCOMPLETE PUSH
17.15	17.18	DELAY					EXPAND RING #2041
17.18	17.27	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
17.27	18.05	DELAY					WAIT FOR MATERIAL FROM SURFACE
18.05	18.15	RING INSTALLATION	2043				
18.15	18.25	DELAY					NO.1 MAIN CONVEYOR SLIPPING
18.25	18.45	MINING		-	-	-	INCOMPLETE PUSH
18.45	18.48	DELAY					EXPAND RING #2042
18.48	19.05	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
19.05	19.15	RING INSTALLATION	2044				
19.15	19.45	LUNCH					
19.45	23.44	MAINTENANCE					CHANGED CUTTERS #13,42B,43A.
							ASSORTED MACHINE MAINTENANCE
							ASSESS REPAIRS TO PUSH PUMP(NO PRESSURE & NOISY)
23.44	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 14,1984
Chainage :Start 3054.01 m
End 3061.51 m
Advance for day 7.50 m

File Name: DY11-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	4.00	DELAY					REMOVE PUSH PUMP MOUNTING BOLTS
4.00	4.30	LUNCH					
4.30	5.40	DELAY					CONTINUE REMOVING BOLTS
5.40	8.00	DELAY					REMOVE PUSH PUMP ASSEMBLY FROM T.B.M.
		-- SHIFT CHANGE------					
8.00	16.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
							INSTALL NEW PUSH PUMP ASSEMBLY
16.00	16.16	-- SHIFT CHANGE------					
16.16	18.30	DELAY					END INSTALLATION OF PUSH PUMP
							REPLACE HYDRLC. HOSE(NO.3 MAIN DRIVE MOTOR RETURN)
18.30	19.00	MINING		-	-	-	INCOMPLETE PUSH
19.00	19.03	DELAY					EXPAND RING #2043
19.03	19.10	MINING		-	-	-	INCOMPLETE PUSH
19.10	19.15	DELAY					PRIMARY BELT SLIPPING
19.15	19.20	MINING		1.50	3-8,16-24	14000	COMPLETED PUSH
19.20	19.30	RING INSTALLATION	2045				
19.30	19.57	MINING		-	-	-	INCOMPLETE PUSH
19.57	20.00	DELAY					EXPAND RING #2044
20.00	20.15	MINING		1.50	3-8,13-24	14000	COMPLETED PUSH
20.15	20.45	LUNCH					
20.45	20.55	RING INSTALLATION	2046				
20.55	21.10	MINING		-	-	-	INCOMPLETE PUSH
21.10	21.15	DELAY					PRIMARY BELT SLIPPING
21.15	21.50	DELAY					ADJUST SCRAPER @ SCNDRY BELT HEADROLLER
21.50	22.10	MINING		1.50	3-8,11-24	14000	COMPLETED PUSH
22.10	22.20	RING INSTALLATION	2047				
22.20	22.40	MINING		-	-	-	INCOMPLETE PUSH
22.40	22.43	DELAY					EXPAND RING #2045
22.43	23.05	MINING		1.50	3-8,16-24	14000	COMPLETED PUSH
23.05	23.15	RING INSTALLATION	2048				
23.15	23.20	MINING		-	-	-	INCOMPLETE PUSH
23.20	23.30	DELAY					PRIMARY BELT SLIPPING
23.30	23.42	MINING		-	-	-	INCONPLETE PUSH
23.42	23.45	DELAY					EXPAND RING #2046

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 14,1984
Chainage :Start 3054.01 m
End 3061.51 m
Advance for day 7.50 m

File Name: DY11-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
23.45	24.00	MINING -- SHIFT CHANGE------		1.50	3,4,11-24	14000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 15,1984
Chainage :Start 3061.51 m
End 3092.01 m
Advance for day 30.50 m

File Name: DY11-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.10	RING INSTALLATION	2049				
0.10	0.50	MINING		1.50	3,4,13-24	16000	INCLUDES 3 MIN. TO INSTALL SPACER
0.50	1.02	RING INSTALLATION	2050				
1.02	1.45	MINING		1.50	3,4,13-24	14000	INCLUDES 2 MIN. TO INSTALL SPACER
1.45	1.56	RING INSTALLATION	2051				
1.56	2.10	MINING		-	-	-	INCOMPLETE PUSH
2.10	2.15	DELAY					PRIMARY BELT SLIPPING
2.15	2.40	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH & 3 MIN. SPACER INSTALL.
2.40	2.50	RING INSTALLATION	2052				
2.50	3.30	MINING		1.50	3,4,13-24	11000	INCLUDES 3 MIN. TO INSTALL SPACER
3.30	3.45	RING INSTALLATION	2053				
3.45	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	5.16	MINING		1.50	3-8,13-24	13000	COMPLETED PUSH & 3 MIN. SPACER INSTALL.
5.16	5.30	RING INSTALLATION	2054				
5.30	6.30	MINING		1.50	3-8,13-24	13000	INCLUDES 6 MIN. TO INSTALL SPACER
6.30	6.45	RING INSTALLATION	2055				
6.45	7.28	MINING		1.50	3-8,13-24	13000	INCLUDES 3 MIN. TO INSTALL SPACER
7.28	7.40	RING INSTALLATION	2056				
7.40	8.00	MINING		1.00	3-8,13-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.18	MINING		0.50	3-8,13-24	10500	COMPLETED PUSH
8.18	8.37	RING INSTALLATION	2057				
8.37	8.54	MINING		-	-	-	INCOMPLETE PUSH
8.54	9.00	DELAY					INSTALL MESH
9.00	9.19	MINING		1.50	3-8,13-24	10500	COMPLETED PUSH
9.19	9.40	RING INSTALLATION	2058				
9.40	10.03	MINING		-	-	-	INCOMPLETE PUSH
10.03	10.10	DELAY					INSTALL MESH
10.10	10.30	MINING		1.50	3-8,13-24	10500	COMPLETED PUSH
10.30	10.45	RING INSTALLATION	2059				
10.45	11.30	MINING		1.50	3-8,12-16,18, 20-24	11500	-
11.30	11.48	RING INSTALLATION	2060				
11.48	12.00	MAINTENANCE		-	-	-	SET UP FOR CUTTER CHANGE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 15,1984 File Name: DY11-15A
Chainage :Start 3061.51 m
End 3092.01 m Project No: 831-6014
Advance for day 30.50 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
12.00	12.30	LUNCH					
12.30	15.25	MAINTENANCE		-	-	-	CHANGED CUTTERS #42B,43A. ASSORTED MACHINE MAINTENANCE
15.25	15.44	MINING		-	-	-	INCOMPLETE PUSH
15.44	15.49	DELAY					
15.49	16.00	MINING		0.90	3,4,12-16,18, 20-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.16	MINING		0.60	3,4,11-24	13000	COMPLETED PUSH
16.16	16.40	RING INSTALLATION	2061				
16.40	17.05	MINING		-	-	-	INCOMPLETE PUSH
17.05	17.08	DELAY					EXPAND RING #2060
17.08	17.25	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
17.25	17.35	RING INSTALLATION	2062				
17.35	17.55	MINING		-	-	-	INCOMPLETE PUSH
17.55	17.58	DELAY					EXPAND RING #2061
17.58	18.17	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
18.17	18.27	RING INSTALLATION	2063				
18.27	18.50	MINING		-	-	-	INCOMPLETE PUSH
18.50	18.53	DELAY					EXPAND RING #2062
18.53	19.03	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
19.03	19.12	RING INSTALLATION	2064				
19.12	19.27	MINING		-	-	-	INCOMPLETE PUSH
19.27	19.30	DELAY					EXPAND RING #2063
19.30	19.52	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
19.52	20.02	RING INSTALLATION	2065				
20.02	20.20	MINING		-	-	-	INCOMPLETE PUSH
20.20	20.50	LUNCH					
20.50	21.13	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
21.13	21.23	RING INSTALLATION	2066				
21.23	21.40	MINING		-	-	-	INCOMPLETE PUSH
21.40	21.43	DELAY					EXPAND RING #2065
21.43	22.00	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
22.00	22.10	RING INSTALLATION	2067				
22.10	22.35	MINING		-	-	-	INCOMPLETE PUSH
22.35	22.38	DELAY					EXPAND RING #2066

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 15,1984
Chainage :Start 3061.51 m
End 3092.01 m
Advance for day 30.50 m

File Name: DY11-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.38	22.53	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
22.53	23.00	RING INSTALLATION	2068				
23.00	23.25	MINING		-	-	-	INCOMPLETE PUSH
23.25	23.28	DELAY					EXPAND RING #2067
23.28	23.40	MINING		1.50	3-8,11-24	13000	COMPLETED PUSH
23.40	23.47	RING INSTALLATION	2069				
23.47	24.00	MINING		0.50	3,4,11-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 16,1984
Chainage :Start 3092.01 m
End 3116.86 m
Advance for day 24.85 m

File Name: DY11-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.30	MINING		1.00	3,4,13-24	13000	COMPLETED PUSH
0.30	0.42	RING INSTALLATION	2070				
0.42	1.17	MINING		-	-	-	INCOMPLETE PUSH
1.17	1.20	DELAY					INSTALL SPACERS
1.20	1.30	MINING		1.50	3,4,13-24	11000	COMPLETED PUSH
1.30	1.40	RING INSTALLATION	2071				
1.40	2.20	MINING		-	-	-	INCOMPLETE PUSH
2.20	2.23	DELAY					INSTALL SPACERS
2.23	2.36	MINING		1.50	3,4,14-24	15000	COMPLETED PUSH
2.36	2.46	RING INSTALLATION	2072				
2.46	3.15	MINING		-	-	-	INCOMPLETE PUSH
3.15	3.18	DELAY					INSTALL SPACERS
3.18	3.32	MINING		1.50	6-8,17-24	11000	COMPLETED PUSH
3.32	3.45	RING INSTALLATION	2073				
3.45	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.57	MINING		-	-	-	INCOMPLETE PUSH
4.57	4.59	DELAY					INSTALL SPACERS
4.59	5.15	MINING		1.50	6-8,17-24	11000	COMPLETED PUSH
5.15	5.25	RING INSTALLATION	2074				
5.25	5.56	MINING		-	-	-	INCOMPLETE PUSH
5.56	5.58	DELAY					INSTALL SPACERS
5.58	6.14	MINING		1.50	6-8,17-24	11000	COMPLETED PUSH
6.14	6.26	RING INSTALLATION	2075				
6.26	6.50	MINING		-	-	-	INCOMPLETE PUSH
6.50	6.56	DELAY					MEASURE FOR SPECIAL SET OF RINGS
6.56	7.00	MINING		-	-	-	INCOMPLETE PUSH
7.00	7.05	DELAY					INSTALL SPACERS
7.05	7.21	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
7.21	7.31	RING INSTALLATION	2076				
7.30	8.00	MINING		1.00	3,4,13-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.14	MINING		0.50	3,4,13-24	11000	COMPLETED PUSH
8.14	8.32	RING INSTALLATION	2077				
8.32	8.53	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 16,1984
Chainage :Start 3092.01 m
End 3116.86 m
Advance for day 24.85 m

File Name: DY11-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.53	8.58	DELAY					INSTALL MESH
8.58	9.14	MINING		-	-	-	INCOMPLETE PUSH
9.14	9.18	DELAY					NO POWER TO T.B.M.(3H.P.PUMP TROUBLE)
9.18	9.31	MINING		1.50	3,4,12-24	13500	COMPLETED PUSH
9.31	9.45	RING INSTALLATION	2078				NEW 3 H.P. WATER PUMP INSTALLED
9.45	10.07	MINING		-	-	-	INCOMPLETE PUSH
10.07	12.00	MAINTENANCE		-	-	-	CHANGED 4 CUTTERS
							ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.00	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.00	15.16	DELAY					REPAIR NO.1 DRIVE TAKE-UP WINCH
15.16	15.30	MINING		1.50	3-8,13-24	13500	COMPLETED PUSH
15.30	16.00	RING INSTALLATION	2079				SPECIAL SET INSTALLED
		-- SHIFT CHANGE--					
16.00	16.25	MINING		-	-	-	INCOMPLETE PUSH
16.25	16.30	DELAY					EXPAND RING #2078 & INSTALL MESH
16.30	16.45	MINING		1.35	3,4,12-24	12500	COMPLETED PUSH
16.45	16.58	RING INSTALLATION	2080				
16.58	17.10	MINING		-	-	-	INCOMPLETE PUSH
17.10	17.30	DELAY					TRY TO INSTALL SPECIAL THRUST BEAMS (RING #2078-2079)
17.30	17.40	DELAY					PRIMARY BELT SLIPPING
17.40	17.50	MINING		-	-	-	INCOMPLETE PUSH
17.50	18.00	DELAY					EXPAND RING #2079 & INSTALL MESH
18.00	18.15	MINING		1.50	3,4,12-24	12500	COMPLETED PUSH
18.15	18.28	RING INSTALLATION	2081				
18.28	18.55	MINING		-	-	-	INCOMPLETE PUSH
18.55	18.58	DELAY					EXPAND RING #2080
18.58	19.13	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
19.13	19.24	RING INSTALLATION	2082				
19.24	19.44	MINING		-	-	-	INCOMPLETE PUSH
19.44	19.47	DELAY					EXPAND RING #2081
19.47	20.10	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
20.10	20.40	LUNCH					
20.40	20.53	RING INSTALLATION	2083				
20.53	21.15	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 16,1984
Chainage :Start 3092.01 m
End 3116.86 m
Advance for day 24.85 m

File Name: DY11-16A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.15	21.18	DELAY					EXPAND RING #2082
21.18	21.30	MINING		-	-	-	INCOMPLETE PUSH
21.30	21.40	DELAY					PRIMARY BELT SLIPPING
21.40	21.50	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
21.50	22.03	RING INSTALLATION	2084				
22.03	22.30	MINING		-	-	-	INCOMPLETE PUSH
22.30	22.33	DELAY					EXPAND RING #2083
22.33	22.50	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
22.50	23.03	RING INSTALLATION	2085				
23.03	23.30	MINING		-	-	-	INCOMPLETE PUSH
23.30	23.33	DELAY					EXPAND RING #2084
23.33	23.50	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
23.50	24.00	RING INSTALLATION	2086				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 17,1984
Chainage :Start 3116.86 m
End 3128.28 m REVISED
Advance for day 11.42 m

File Name: DY11-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.30	MINING		-	-	-	INCOMPLETE PUSH
0.30	0.32	DELAY					INSTALL SPACERS
0.32	0.45	MINING		1.50	9,12,13-24	13000	COMPLETED PUSH
0.45	0.56	RING INSTALLATION	2087				
0.56	1.22	MINING		-	-	-	INCOMPLETE PUSH
1.22	1.24	DELAY					INSTALL SPACERS
1.24	1.44	MINING		1.50	9,12,13-24	13000	COMPLETED PUSH
1.44	1.58	RING INSTALLATION	2088				
1.58	2.25	MINING		-	-	-	INCOMPLETE PUSH
2.25	2.27	DELAY					INSTALL SPACERS
2.27	2.44	MINING		1.50	3,4,17-24	13000	COMPLETED PUSH
2.44	2.57	RING INSTALLATION	2089				
2.57	3.25	MINING		-	-	-	INCOMPLETE PUSH
3.25	3.30	DELAY					INSTALL SPACERS
3.30	3.35	DELAY					SCRUBBER TRIPPED OFF ACCIDENTLY
3.35	3.48	MINING		1.50	3,4,17-24	13000	COMPLETED PUSH
3.48	4.00	RING INSTALLATION	2090				
4.00	4.15	MINING		-	-	-	INCOMPLETE PUSH
4.15	4.45	LUNCH					
4.45	5.10	MINING		-	-	-	INCOMPLETE PUSH
5.10	5.14	DELAY					INSTALL SPACERS
5.14	5.30	MINING		1.50	3,4,17-24	13000	COMPLETED PUSH
5.30	5.40	RING INSTALLATION	2091				
5.40	6.06	MINING		-	-	-	INCOMPLETE PUSH
6.06	6.09	DELAY					INSTALL SPACERS
6.09	6.28	MINING		1.50	3,4,17-24	13000	COMPLETED PUSH
6.28	6.38	RING INSTALLATION	2092				
6.38	7.10	MINING		-	-	-	INCOMPLETE PUSH
7.10	7.13	DELAY					INSTALL SPACERS
7.13	7.28	MINING		1.50	3,4,17-24	13000	COMPLETED PUSH
7.28	7.40	RING INSTALLATION	2093				
7.40	8.00	MINING		1.00	3,4,17-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 19,1984 REVISED
Chainage :Start 3128.28 m
End 3145.28 m
Advance for day 17.00 m

File Name: DY11-19A
Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.25	-- SHIFT CHANGE------					
8.25	8.40	DELAY					WARM UP T.B.M.
8.40	8.50	MINING		-	-	-	INCOMPLETE PUSH
8.50	9.25	DELAY					SECONDARY BELT SLIPPING
9.25	9.38	MINING		0.50	3-8,13-20	12000	COMPLETED PUSH
9.38	9.48	RING INSTALLATION	2094				
9.48	10.10	MINING		-	-	-	INCOMPLETE PUSH
10.10	10.13	DELAY					INSTALL SPACERS
10.13	10.38	MINING		1.50	3-8,13-24	12000	COMPLETED PUSH
10.38	10.48	RING INSTALLATION	2095				
10.48	11.16	MINING		-	-	-	INCOMPLETE PUSH
11.16	11.19	DELAY					INSTALL SPACERS
11.19	11.38	MINING		1.50	3-20	11000	COMPLETED PUSH
11.38	11.50	RING INSTALLATION	2096				
11.50	12.20	MINING		-	-	-	INCOMPLETE PUSH
12.20	12.50	LUNCH					
12.50	12.58	MINING		-	-	-	INCOMPLETE PUSH
12.58	13.00	DELAY					INSTALL SPACERS
13.00	13.17	MINING		1.50	3-20	11000	COMPLETED PUSH
13.17	13.30	RING INSTALLATION	2097				
13.30	15.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE REPAIR LEAK IN NO.12 HYDRLC. MOTOR
15.00	15.26	MINING		-	-	-	INCOMPLETE PUSH
15.26	15.28	DELAY					INSTALL SPACERS
15.28	16.00	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
		-- SHIFT CHANGE------					
16.00	16.10	RING INSTALLATION	2098				
16.10	16.28	MINING		-	-	-	INCOMPLETE PUSH
16.28	16.31	DELAY					INSTALL SPACERS
16.31	16.58	MINING		1.50	3,4,9-13,15, 17-24	14000	COMPLETED PUSH
16.58	17.09	RING INSTALLATION	2099				
17.09	17.39	MINING		-	-	-	INCOMPLETE PUSH
17.39	17.42	DELAY			3,4,9-13,15,		INSTALL SPACERS
17.42	17.53	MINING		1.50	17-24	14000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 20,1984
Chainage :Start 3145.28 m
End 3166.88 m
Advance for day 21.60 m

File Name: DY11-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.25	MINING		-	-	-	INCOMPLETE PUSH
0.25	0.28	DELAY					EXPAND RING #2104
0.28	0.50	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
0.50	1.00	RING INSTALLATION	2106				
1.00	1.25	MINING		-	-	-	INCOMPLETE PUSH
1.25	1.28	DELAY					EXPAND RING #2105
1.28	1.47	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
1.47	1.56	RING INSTALLATION	2107				
1.56	2.20	MINING		-	-	-	INCOMPLETE PUSH
2.20	2.23	DELAY					EXPAND RING #2106
2.23	2.44	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
2.44	2.58	RING INSTALLATION	2108				
2.58	3.25	MINING		-	-	-	INCOMPLETE PUSH
3.25	3.28	DELAY					EXPAND RING #2107
3.28	3.45	MINING		1.50	3-8,11-24	12000	COMPLETED PUSH
3.45	3.58	RING INSTALLATION	2109				
3.58	4.20	MINING		-	-	-	INCOMPLETE PUSH
4.20	4.50	LUNCH					
4.50	4.53	DELAY					EXPAND RING #2108
4.53	5.20	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
5.20	5.34	RING INSTALLATION	2110				
5.34	6.00	MINING		-	-	-	INCOMPLETE PUSH
6.00	6.03	DELAY					EXPAND RING #2109
6.03	6.30	MINING		1.50	3-8,11-24	12000	COMPLETED PUSH
6.30	6.43	RING INSTALLATION	2111				
6.43	7.05	MINING		-	-	-	INCOMPLETE PUSH
7.05	7.08	DELAY					EXPAND RING#2110
7.08	7.33	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
7.33	7.45	RING INSTALLATION	2112				
7.45	8.00	MINING		0.50	3-8,11-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.24	MINING		-	-	-	INCOMPLETE PUSH
8.24	8.27	DELAY					INSTALL SPACERS
8.27	8.40	MINING		1.00	3-8,13-24	11000	COMPLETED PUSH
8.40	8.50	RING INSTALLATION	2113				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 20,1984
Chainage :Start 3145.28 m
End 3166.88 m
Advance for day 21.60 m

File Name: DY11-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.50	9.20	MINING		-	-	-	INCOMPLETE PUSH
9.20	9.22	DELAY					INSTALL SPACERS
9.22	9.33	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
9.33	9.43	RING INSTALLATION	2114				
9.43	10.09	MINING		-	-	-	INCOMPLETE PUSH
10.09	10.12	DELAY					INSTALL SPACERS
10.12	10.33	MINING		1.50	13-24	16000	COMPLETED PUSH
10.33	10.45	RING INSTALLATION	2115				
10.45	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,39,42B,43A. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.35	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.35	15.04	MINING		-	-	-	INCOMPLETE PUSH
15.04	15.06	DELAY					INSTALL SPACERS
15.06	15.25	MINING		1.50	13-24	13000	COMPLETED PUSH
15.25	15.35	RING INSTALLATION	2116				
15.35	15.56	MINING		-	-	-	INCOMPLETE PUSH
15.56	15.58	DELAY					INSTALL SPACERS
15.58	16.00	MINING		1.00	13-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.19	MINING		0.50	13-24	13000	COMPLETED PUSH
16.19	16.28	DELAY					INSTALL SPACERS & EXPAND RING #2115
16.28	16.42	RING INSTALLATION	2117				
16.42	17.13	MINING		-	-	-	INCOMPLETE PUSH
17.13	17.15	DELAY					INSTALL SPACERS
17.15	17.21	MINING		-	-	-	INCOMPLETE PUSH
17.21	17.25	DELAY					POWER TRIPPED OFF TO T.B.M.
17.25	17.37	MINING		1.50	3,4,11,13,15, 17-24	15500	COMPLETED PUSH
17.37	17.48	RING INSTALLATION	2118				
17.48	18.34	DELAY					WATER HOSE RUPTURED, REPAIRED & RUPTURED AGAIN THEN RUPTURED IN ANOTHER SPOT.
18.34	18.39	MINING		-	-	-	INCOMPLETE PUSH
18.39	20.28	DELAY					TRY TO LOWER WATER PRESSURE
20.28	20.51	MINING		-	-	-	INCOMPLETE PUSH
20.51	20.53	DELAY					INSTALL SPACERS

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 20,1984
Chainage :Start 3145.28 m
End 3166.88 m
Advance for day 21.60 m

File Name: DY11-20A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.53	23.08	MINING		1.50	3,4,11,13,15, 17-24	15500	COMPLETED PUSH
23.08	23.22	RING INSTALLATION	2119				
23.22	23.40	MINING		0.60	3,4,11,13,15, 17-24	14500	INCOMPLETE PUSH
23.40	24.00	-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: NOVEMBER 21,1984
Chainage :Start: 3166.88 m
End: 3190.38 m
Advance for day: 23.50 m

File Name: DY11-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.18	-- SHIFT CHANGE------					
0.18	0.30	MINING		-	-	-	INCOMPLETE PUSH
0.30	0.35	DELAY					INSTALL MESH & EXPAND RING #2118
0.35	0.53	MINING		0.90	3,4,11-24	13000	COMPLETED PUSH
0.53	1.05	RING INSTALLATION	2120				
1.05	1.25	MINING		-	-	-	INCOMPLETE PUSH
1.25	1.28	DELAY					EXPAND RING #2119
1.28	1.50	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
1.50	2.03	RING INSTALLATION	2121				
2.03	2.25	MINING		-	-	-	INCOMPLETE PUSH
2.25	2.28	DELAY					EXPAND RING #2120
2.28	2.48	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
2.48	3.00	RING INSTALLATION	2122				
3.00	3.25	MINING		-	-	-	INCOMPLETE PUSH
3.25	3.28	DELAY					EXPAND RING #2121
3.28	3.46	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
3.46	4.00	RING INSTALLATION	2123				
4.00	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.10	DELAY					WATER HOSE PARTED AT COUPLING
5.10	5.25	MINING		1.50	3-8,11-24	12000	COMPLETED PUSH
5.25	5.38	RING INSTALLATION	2124				
5.38	6.00	MINING		-	-	-	INCOMPLETE PUSH
6.00	6.10	DELAY					INSTALL MESH & EXPAND RING #2123
6.10	6.35	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
6.35	6.48	RING INSTALLATION	2125				
6.48	7.10	MINING		-	-	-	INCOMPLETE PUSH
7.10	7.13	DELAY					EXPAND RING #2124
7.13	7.42	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
7.42	8.25	-- SHIFT CHANGE------					
8.25	8.35	DELAY					FIX WATER LINE & INSTALL REDUCER VALVE
8.35	8.50	RING INSTALLATION	2126				
8.50	9.15	MINING		-	-	-	INCOMPLETE PUSH
9.15	9.17	DELAY					INSTALL SPACERS
9.17	9.40	MINING		1.50	3,4,13-24	15000	COMPLETED PUSH
9.40	9.51	RING INSTALLATION	2127				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 21,1984
Chainage :Start 3166.88 m
End 3190.38 m
Advance for day 23.50 m

File Name: DY11-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
9.51	10.10	MINING		-	-	-	INCOMPLETE PUSH
10.10	10.12	DELAY					INSTALL SPACERS
10.12	10.22	DELAY					ELECTRICAL PROBLEMS(NO DRIVENOW SIGNAL)
10.22	10.40	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
10.40	10.50	RING INSTALLATION	2128				
10.50	11.15	MINING		-	-	-	INCOMPLETE PUSH
11.15	11.17	DELAY					INSTALL SPACERS
11.17	11.30	MINING		-	-	-	INCOMPLETE PUSH
11.30	11.40	DELAY					HOOKUP OIL LINE(FLUSH GREASE FROM HEAD)
11.40	11.50	MINING		1.50	3,4,17-24	13000	COMPLETED PUSH
11.50	12.00	RING INSTALLATION	2129				
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE		-	-	-	CHANGED CUTTERS #16,42A,43B.
							ASSORTED MACHINE MAINTENANCE
15.40	16.00	MINING		0.60	3,4,17-24	12000	INCOMPLETE PUSH
16.00	16.35	-- SHIFT CHANGE--					WALK TO FACE FROM DIESEL GARAGE
16.35	16.42	MINING		-	-	-	INCOMPLETE PUSH
16.42	16.44	DELAY					INSTALL SPACERS
16.44	17.02	MINING		0.90	3,4,12,14, 16-24	13500	COMPLETED PUSH
17.02	17.16	RING INSTALLATION	2130				
17.16	17.27	MINING		-	-	-	INCOMPLETE PUSH
17.27	17.32	DELAY					RING ROTATING(PLACE EXPANSION RING)
17.32	17.57	MINING		-	-	-	INCOMPLETE PUSH
17.57	18.02	DELAY					INSTALL SPACERS & EXPAND RING
18.02	18.15	MINING		1.50	3,4,12,14, 16-24	12500	COMPLETED PUSH
18.15	18.29	RING INSTALLATION	2131				
18.29	19.07	MINING		-	-	-	INCOMPLETE PUSH
19.07	19.09	DELAY					INSTALL SPACERS
19.09	19.21	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
19.21	19.33	RING INSTALLATION	2132				
19.33	20.06	MINING		-	-	-	INCOMPLETE PUSH
20.06	20.08	DELAY					INSTALL SPACERS
20.08	20.21	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
20.21	20.33	RING INSTALLATION	2133				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 21,1984
Chainage :Start 3166.88 m
End 3190.38 m
Advance for day 23.50 m

File Name: DY11-21A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
20.33	20.50	MINING		-	-	-	INCOMPLETE PUSH
20.50	21.20	LUNCH					
21.20	21.48	MINING		-	-	-	INCOMPLETE PUSH
21.48	21.51	DELAY					INSTALL SPACERS
21.51	22.07	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
22.07	22.17	RING INSTALLATION	2134				
22.17	22.35	DELAY					PLATE CAME OFF(W.SIDE SLIDING JOINT ON RING #2133)
22.35	23.08	MINING		-	-	-	INCOMPLETE PUSH
23.08	23.25	DELAY					RPLCE W.SIDE SLIDING JOINT(RING #2133)
23.25	23.31	MINING		-	-	-	INCOMPLETE PUSH
23.31	23.33	DELAY					INSTALL SPACERS
23.33	23.41	MINING		1.50	3,4,11,13-24	12500	COMPLETED PUSH
23.41	23.56	RING INSTALLATION	2135				
23.56	24.00	MINING		0.10	3,4,11-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 22,1984 File Name: DY11-22A
Chainage :Start 3190.38 m
End 3215.18 m Project No: 831-6014
Advance for day 24.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.25	MINING		-	-	-	INCOMPLETE PUSH
0.25	0.30	DELAY					INSTALL MESH & EXPAND RING #2134
0.30	0.55	MINING		1.40	3-8,11-24	11000	COMPLETED PUSH
0.55	1.10	RING INSTALLATION	2136				
1.10	1.40	MINING		-	-	-	INCOMPLETE PUSH
1.40	1.45	DELAY					INSTALL MESH & EXPAND RING #2135
1.45	2.05	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
2.05	2.20	RING INSTALLATION	2137				
2.20	2.40	MINING		-	-	-	INCOMPLETE PUSH
2.40	2.45	DELAY					INSTALL MESH & EXPAND RING #2136
2.45	3.12	MINING		1.50	3-8,11-24	12000	COMPLETED PUSH
3.12	3.23	RING INSTALLATION	2138				
3.23	3.55	MINING		-	-	-	INCOMPLETE PUSH
3.55	4.00	DELAY					INSTALL MESH & EXPAND RING #2137
4.00	4.30	LUNCH					
4.30	4.48	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
4.48	5.00	RING INSTALLATION	2139				
5.00	5.30	MINING		-	-	-	INCOMPLETE PUSH
5.30	5.35	DELAY					INSTALL MESH & EXPAND RING #2138
5.35	5.55	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
5.55	6.10	RING INSTALLATION	2140				
6.10	6.35	MINING		-	-	-	INCOMPLETE PUSH
6.35	6.40	DELAY					INSTALL MESH & EXPAND RING #2139
6.40	7.00	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
7.00	7.10	RING INSTALLATION	2141				
7.10	7.30	MINING		-	-	-	INCOMPLETE PUSH
7.30	7.35	DELAY					INSTALL MESH & EXPAND RING #2140
7.35	8.00	MINING		1.30	3,4,11-24	12000	COMPLETED PUSH
		-- SHIFT CHANGE------					
8.00	8.10	RING INSTALLATION	2142				
8.10	8.45	MINING		-	-	-	INCOMPLETE PUSH
8.45	8.47	DELAY					INSTALL SPACERS
8.47	9.02	MINING		1.50	3,4,9-24	10000	COMPLETED PUSH
9.02	9.12	RING INSTALLATION	2143				
9.12	9.36	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 22,1984 File Name: DY11-22A
Chainage :Start 3190.38 m
End 3215.18 m Project No: 831-6014
Advance for day 24.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
9.36	9.38	DELAY					INSTALL SPACERS
9.38	10.09	MINING		1.50	3,4,9-24	10000	COMPLETED PUSH
10.09	10.19	RING INSTALLATION	2144				
10.19	10.43	MINING		-	-	-	INCOMPLETE PUSH
10.43	10.45	DELAY					INSTALL SPACERS
10.45	11.10	MINING		1.50	3,4,9-12,17-24	11000	COMPLETED PUSH
11.10	11.20	RING INSTALLATION	2145				
11.20	12.00	MINING		0.80	3,4,9-12,17-24	11000	INCOMPLETE PUSH
12.00	12.30	LUNCH					
12.30	15.55	MAINTENANCE		-	-	-	CHANGED CUTTERS #6,32,42B,43A. ASSORTED MACHINE MAINTENANCE
15.55	16.00	DELAY		-	-	-	POWER OFF IN TUNNEL
		-- SHIFT CHANGE------					
16.00	16.28	DELAY		-	-	-	NO POWER, RE-SET BELTS WHEN POWER ON
16.28	16.54	MINING		0.70	3,4,12,14, 16-24	11000	COMPLETED PUSH
16.54	17.07	RING INSTALLATION	2146				
17.07	17.36	MINING		-	-	-	INCOMPLETE PUSH
17.36	17.38	DELAY					INSTALL SPACERS
17.38	17.59	MINING		1.50	3,4,8,12,14, 16-24	11500	COMPLETED PUSH
17.59	18.10	RING INSTALLATION	2147				
18.10	18.41	MINING		-	-	-	INCOMPLETE PUSH
18.41	18.43	DELAY					INSTALL SPACERS
18.43	19.04	MINING		1.50	3,4,8,12,14, 16-24	12500	COMPLETED PUSH
19.04	19.16	RING INSTALLATION	2148				
19.16	19.48	MINING		-	-	-	INCOMPLETE PUSH
19.48	19.50	DELAY					INSTALL SPACERS
19.50	20.12	MINING		1.50	3,4,12,14, 16-24	13500	COMPLETED PUSH
20.12	20.24	RING INSTALLATION	2149				
20.24	20.40	MINING		-	-	-	INCOMPLETE PUSH
20.40	21.10	LUNCH					
21.10	21.31	MINING		-	-	-	INCOMPLETE PUSH
21.31	21.33	DELAY					INSTALL SPACERS

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 22,1984
Chainage :Start 3190.38 m
End 3215.18 m
Advance for day 24.80 m

File Name: DY11-22A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
21.33	21.54	MINING		1.50	11-24	14000	COMPLETED PUSH
21.54	22.05	RING INSTALLATION	2150				
22.05	22.43	MINING		-	-	-	INCOMPLETE PUSH
22.43	22.45	DELAY					INSTALL SPACERS
22.45	23.07	MINING		1.50	3.5,4.5,12-24	12500	COMPLETED PUSH
23.07	23.18	RING INSTALLATION	2151				
23.18	23.47	MINING		-	-	-	INCOMPLETE PUSH
23.47	23.49	DELAY					INSTALL SPACERS
23.49	24.00	MINING		0.90	3.5,4.5,12-24	12000	COMPLETED PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 23,1984
Chainage :Start 3215.18 m
End 3236.23 m
Advance for day 21.05 m

File Name: DY11-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.20	MINING		0.60	3,4,11-24	11000	COMPLETED PUSH
0.20	0.32	RING INSTALLATION	2152				
0.32	0.55	MINING		-	-	-	INCOMPLETE PUSH
0.55	1.00	DELAY					INSTALL MESH & EXPAND RING #2151
1.00	1.27	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
1.27	1.40	RING INSTALLATION	2153				
1.40	2.00	MINING		-	-	-	INCOMPLETE PUSH
2.00	2.05	DELAY					INSTALL MESH & EXPAND RING #2152
2.05	2.35	MINING		1.50	3-8,11-24	11000	COMPLETED PUSH
2.35	2.47	RING INSTALLATION	2154				
2.47	3.10	MINING		-	-	-	INCOMPLETE PUSH
3.10	3.15	DELAY					INSTALL MESH & EXPAND RING #2153
3.15	3.38	MINING		1.50	3-8,11-24	11000	COMPLETED PUSH
3.38	3.50	RING INSTALLATION	2155				
3.50	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.50	MINING		-	-	-	INCOMPLETE PUSH
4.50	4.55	DELAY					INSTALL MESH & EXPAND RING #2154
4.55	5.15	MINING		1.50	3-8,12-24	11000	COMPLETED PUSH
5.15	5.27	RING INSTALLATION	2156				
5.27	5.47	MINING		-	-	-	INCOMPLETE PUSH
5.47	5.52	DELAY					INSTALL MESH & EXPAND RING #2155
5.52	6.25	MINING		1.50	3-8,11-24	11000	COMPLETED PUSH
6.25	6.35	RING INSTALLATION	2157				
6.35	6.48	DELAY					OIL LEAK (NO.1 PUMP, STEEL LINE)
6.48	7.20	MINING		0.75	3-8,11-24	13000	INCOMPLETE PUSH
7.20	8.00	DELAY					MAIN CONVEYOR OFF, 20 FT. OF BELT STRUCTURE COLLAPSED (NO.3 CONVEYOR)
		-- SHIFT CHANGE------					
8.00	8.20	MINING		-	-	-	INCOMPLETE PUSH
8.20	8.22	DELAY					INSTALL SPACERS
8.22	8.32	MINING		0.75	3-24	15000	COMPLETED PUSH
8.32	8.42	RING INSTALLATION	2158				
8.42	9.00	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 23,1984
Chainage :Start 3215.18 m
End 3236.23 m
Advance for day 21.05 m

File Name: DY11-23A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
9.00	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #9,10,42A,43B. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	13.00	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.00	13.20	DELAY					REPAIR HYDRLC.LINE TO NO.1 PUMP
13.20	13.25	DELAY					LOW OIL LEVEL IN T.B.M.
13.25	13.50	MINING		-	-	-	INCOMPLETE PUSH
13.50	13.52	DELAY					INSTALL SPACERS
13.52	14.10	MINING		1.50	3-24	15000	COMPLETED PUSH
14.10	14.24	RING INSTALLATION	2159				
14.24	14.48	MINING		-	-	-	INCOMPLETE PUSH
14.48	14.50	DELAY					INSTALL SPACERS
14.50	15.00	MINING		1.00	3-12,13-24	15000	INCOMPLETE PUSH
15.00	16.00	DELAY					FIX HYDRLC.HOSE(NO.2 MAIN DRIVE RETURN)
		-- SHIFT CHANGE--					
16.00	16.23	DELAY					END HYDRLC. HOSE REPAIR
16.23	16.45	MINING		0.50	3-12,13-24	15000	COMPLETED PUSH
16.45	16.57	RING INSTALLATION	2160				
16.57	17.27	MINING		-	-	-	INCOMPLETE PUSH
17.27	17.29	DELAY					INSTALL SPACERS
17.29	17.52	MINING		1.50	3,4,11-24	14500	COMPLETED PUSH
17.52	18.04	RING INSTALLATION	2161				
18.04	18.13	MINING		-	-	-	INCOMPLETE PUSH
18.13	18.20	DELAY					PRMRY CONVEYOR STOPPED,MUCK IN HEAD
18.20	18.48	MINING		-	-	-	INCOMPLETE PUSH
18.48	18.51	DELAY					INSTALL SPACERS
18.51	19.17	MINING		1.50	3,4,16-24	15000	COMPLETED PUSH
19.17	19.28	RING INSTALLATION	2162				
19.28	19.58	MINING		-	-	-	INCOMPLETE PUSH
19.58	20.00	DELAY					INSTALL SPACERS
20.00	20.19	MINING		1.50	3,4,12-24	15000	COMPLETED PUSH
20.19	20.32	RING INSTALLATION	2163				
20.32	20.55	MINING		-	-	-	INCOMPLETE PUSH
20.55	21.25	LUNCH					
21.25	21.46	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 23,1984 File Name: DY11-23A
Chainage :Start 3215.18 m
End 3236.23 m Project No: 831-6014
Advance for day 21.05 m

Time (hours)		Activity	Ring	Advance	Push Cylinder		Comments
Start	End		No.	(m)	In use	Pressure (kPa)	
21.46	21.49	DELAY					INSTALL SPACERS
21.49	22.09	MINING		1.50	3,4,12-24	14500	COMPLETED PUSH
22.09	22.26	RING INSTALLATION	2164				SPECIAL SET
22.26	22.52	MINING		-	-	-	INCOMPLETE PUSH
22.52	22.54	DELAY					INSTALL SPACERS
22.54	23.16	MINING		1.45	11-24	14500	COMPLETED PUSH
23.16	23.26	RING INSTALLATION	2165				
23.26	24.00	MINING		1.00	11-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 24,1984
Chainage :Start 3236.23 m
End 3247.23 m
Advance for day 11.00 m

File Name: DY11-24A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.20	MINING		0.50	3,4,11-24	13000	COMPLETED PUSH
0.20	0.33	RING INSTALLATION	2166				
0.33	0.55	MINING		-	-	-	INCOMPLETE PUSH
0.55	1.00	DELAY					INSTALL MESH & EXPAND RING #2165
1.00	1.30	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
1.30	1.40	RING INSTALLATION	2167				
1.40	2.00	MINING		-	-	-	INCOMPLETE PUSH
2.00	2.05	DELAY					INSTALL MESH & EXPAND RING #2166
2.05	2.35	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
2.35	2.45	RING INSTALLATION	2168				
2.45	3.05	MINING		-	-	-	INCOMPLETE PUSH
3.05	3.10	DELAY					INSTALL MESH & EXPAND RING #2167
3.10	3.35	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
3.35	3.45	RING INSTALLATION	2169				
3.45	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.40	MINING		-	-	-	INCOMPLETE PUSH
4.40	4.45	DELAY					INSTALL MESH & EXPAND RING #2168
4.45	5.07	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
5.07	5.17	RING INSTALLATION	2170				
5.17	5.37	MINING		-	-	-	INCOMPLETE PUSH
5.37	5.42	DELAY					INSTALL MESH & EXPAND RING #2169
5.42	6.05	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
6.05	6.15	RING INSTALLATION	2171				
6.15	6.35	MINING		-	-	-	INCOMPLETE PUSH
6.35	6.40	DELAY					INSTALL MESH & EXPAND RING #2170
6.40	7.05	MINING		1.50	3-8,11-24	13000	COMPLETED PUSH
7.05	7.15	RING INSTALLATION	2172				
7.15	7.35	MINING		-	-	-	INCOMPLETE PUSH
7.35	7.40	DELAY					INSTALL MESH & EXPAND RING #2171
7.40	8.12	MINING		1.50	3-8,12-24	13000	COMPLETED PUSH
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 26,1984 File Name: DY11-26A
Chainage :Start 3247.08 m REVISED
End 3259.68 m Project No: 831-6014
Advance for day 12.60 m

Time (hours)		Activity	Ring	Advance	Push Cylinder		Comments
Start	End		No.	(m)	In use	Pressure (kPa)	
18.35	18.50	MINING		1.50	3-8,13-24	12000	COMPLETED PUSH
18.50	19.02	RING INSTALLATION	2181				
19.02	19.25	MINING		0.60	3-8,13-24	12000	INCOMPLETE PUSH
19.25	20.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #17,42B,43A.
20.00	20.30	LUNCH					
20.30	23.00	MAINTENANCE & DELAY		-	-	-	END CUTTER CHANGE
							ASSORTED MACHINE MAINTENANCE
							REPAIR PRIMARY CONVEYOR BELT
23.00	24.00	DELAY		-	-	-	CONTINUE REPAIRING PRIMARY BELT
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 26,1984 File Name: DY11-26A
Chainage :Start 3247.08 m REVISED
End 3259.68 m Project No: 831-6014
Advance for day 12.60 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.25	-- SHIFT CHANGE------					
8.25	8.40	DELAY		-	-	-	START UP T.B.M.
8.40	9.14	DELAY		-	-	-	UNABLE TO START NO.4 MAIN DRIVE MOTOR
9.14	9.24	RING INSTALLATION	2173				
9.24	9.55	MINING		-	-	-	INCOMPLETE PUSH
9.55	9.58	DELAY					INSTALL SPACERS
9.58	10.19	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
10.19	10.31	RING INSTALLATION	2174				
10.31	11.14	MINING		-	-	-	INCOMPLETE PUSH
11.14	11.16	DELAY					INSTALL SPACERS
11.16	11.33	MINING		1.50	3-8,13-24	10500	COMPLETED PUSH
11.33	11.46	RING INSTALLATION	2175				
11.46	12.00	MINING		-	-	-	INCOMPLETE PUSH
12.00	12.30	LUNCH					
12.30	12.57	MINING		-	-	-	INCOMPLETE PUSH
12.57	12.59	DELAY					INSTALL SPACERS
12.59	13.25	MINING		1.50	3,4,11,13-24	15000	COMPLETED PUSH
13.25	13.38	RING INSTALLATION	2176				
13.38	14.12	MINING		-	-	-	INCOMPLETE PUSH
14.12	14.14	DELAY					INSTALL SPACERS
14.14	14.31	MINING		1.50	3,4,11-24	15000	COMPLETED PUSH
14.31	14.43	RING INSTALLATION	2177				
14.43	15.15	MINING		-	-	-	INCOMPLETE PUSH
15.15	15.17	DELAY					INSTALL SPACERS
15.17	15.35	MINING		1.50	3-8,17-24	15000	COMPLETED PUSH
15.35	15.46	RING INSTALLATION	2178				
15.46	16.00	MINING		0.50	3-8,13-16, 20-24	15000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.37	MINING		1.00	3-8,13-24	12000	COMPLETED PUSH
16.37	16.47	RING INSTALLATION	2179				
16.47	17.42	MINING		1.50	3-8,13-24	12000	-
17.42	17.53	RING INSTALLATION	2180				
17.53	18.25	MINING		-	-	-	INCOMPLETE PUSH
18.25	18.35	DELAY					CUT OFF DAMAGED PIECE(PRIMARY CONVEYOR)

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY11-27A

Project No: 831-6014

Date NOVEMBER 27,1984
Chainage :Start 3259.68 m
End 3287.58 m
Advance for day 27.90 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE--					
0.00	2.16	DELAY					END REPAIR OF PRIMARY CONVEYOR
2.16	2.50	MINING		0.90	3-8,13-20	15000+	COMPLETED PUSH
2.50	3.04	RING INSTALLATION	2182				
3.04	3.27	MINING		-	-	-	INCOMPLETE PUSH
3.27	3.29	DELAY					INSTALLED SPACERS
3.29	3.59	MINING		1.50	3-8,11,12,14, 16-24	11000	COMPLETED PUSH
3.59	4.12	RING INSTALLATION	2183				
4.12	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.05	MINING		-	-	-	INCOMPLETE PUSH
5.05	5.17	DELAY					NO.4 MAIN CONVEYOR TAIL ROLLER LOOSE
5.17	5.25	MINING		-	-	-	INCOMPLETE PUSH
5.25	5.27	DELAY					INSTALL SPACERS
5.27	5.53	MINING		1.50	3,4,6,8,11,12, 13-24	13000	COMPLETED PUSH
5.53	6.05	RING INSTALLATION	2184				
6.05	6.31	MINING		-	-	-	INCOMPLETE PUSH
6.31	6.33	DELAY					INSTALL SPACERS
6.33	7.00	MINING		1.50	3,4,6,8,11-24	11000	COMPLETED PUSH
7.00	7.12	RING INSTALLATION	2185				
7.12	7.35	MINING		-	-	-	INCOMPLETE PUSH
7.35	7.37	DELAY					INSTALL SPACERS
7.37	8.00	MINING		1.50	3.5,4.5,11-24	14000	COMPLETED PUSH
		-- SHIFT CHANGE--					
8.00	8.12	RING INSTALLATION	2186				
8.12	8.40	MINING		-	-	-	INCOMPLETE PUSH
8.40	8.43	DELAY					EXPAND RING #2185
8.43	9.05	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
9.05	9.17	RING INSTALLATION	2187				
9.17	9.36	DELAY					CHANGED T.B.M. WATER PUMP
9.36	10.05	MINING		-	-	-	INCOMPLETE PUSH
10.05	10.08	DELAY					EXPAND RING #2186
10.08	10.30	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
10.30	10.40	RING INSTALLATION	2188				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 27,1984 File Name: DY11-27A
Chainage :Start 3259.68 m
End 3287.58 m Project No: 831-6014
Advance for day 27.90 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
10.40	11.10	MINING		-	-	-	INCOMPLETE PUSH
11.10	11.13	DELAY					EXPAND RING #2187
11.13	11.33	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
11.33	11.42	RING INSTALLATION	2189				
11.42	12.05	MINING		-	-	-	INCOMPLETE PUSH
12.05	12.35	LUNCH					
12.35	12.38	DELAY					EXPAND RING #2188
12.38	13.12	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
13.12	13.20	RING INSTALLATION	2190				
13.20	13.45	MINING		-	-	-	INCOMPLETE PUSH
13.45	13.48	DELAY					EXPAND RING #2189
13.48	14.12	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
14.12	14.20	RING INSTALLATION	2191				
14.20	14.40	DELAY					EXTEND SF6 SWITCH & 500 FT. OF CABLE
14.40	15.05	MINING		-	-	-	INCOMPLETE PUSH
15.05	15.08	DELAY					EXPAND RING #2190
15.08	15.32	MINING		1.50	3,4,9-24	12500	COMPLETED PUSH
15.32	15.40	RING INSTALLATION	2192				
15.40	16.00	MINING		0.60	3,4,9-24	12500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.31	MINING		0.90	3,4,13-24	15000	COMPLETED PUSH
16.31	16.41	RING INSTALLATION	2193				
16.41	17.30	MINING		1.50	3,4,13-24	15000	-
17.30	17.44	RING INSTALLATION	2194				
17.44	17.53	MINING		-	-	-	INCOMPLETE PUSH
17.53	18.04	DELAY					INSTALL MESH
18.04	18.40	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
18.40	18.51	RING INSTALLATION	2195				
18.51	19.36	MINING		1.50	3,4,13-24	12000	-
19.36	19.46	RING INSTALLATION	2196				
19.46	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.06	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
21.06	21.16	RING INSTALLATION	2197				
21.16	22.06	MINING		1.50	3,4,13-24	12000	-
22.06	22.16	RING INSTALLATION	2198				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 2)

Date NOVEMBER 27,1984
Chainage :Start 3259.68 m
End 3287.58 m
Advance for day 27.90 m

File Name: DY11-27A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
22.16	23.02	MINING		1.50	3,4,13-24	12000	-
23.02	23.12	RING INSTALLATION	2199				
23.12	23.56	MINING		1.50	3,4,13-24	12000	-
23.56	24.00	RING INSTALLATION	2200				PARTIAL INSTALLATION
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 28,1984 File Name: DY11-28A
Chainage :Start 3287.58 m
End 3304.58 m Project No: 831-6014
Advance for day 17.00 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.05	RING INSTALLATION	2200				COMPLETE INSTALLATION
0.05	0.37	MINING		-	-	-	INCOMPLETE PUSH
0.37	0.39	DELAY					INSTALL SPACERS
0.39	0.55	MINING		1.50	3,4,13-24	13500	COMPLETED PUSH
0.55	1.05	RING INSTALLATION	2201				
1.05	1.36	MINING		-	-	-	INCOMPLETE PUSH
1.36	1.37	DELAY					INSTALL SPACERS
1.37	1.50	MINING		1.50	3,4,13-24	14000	COMPLETED PUSH
1.50	2.03	RING INSTALLATION	2202				
2.03	2.33	MINING		-	-	-	INCOMPLETE PUSH
2.33	2.35	DELAY					INSTALL SPACERS
2.35	2.51	MINING		1.50	3,4,13-24	13500	COMPLETED PUSH
2.51	3.05	RING INSTALLATION	2203				
3.05	3.20	MAINTENANCE		-	-	-	CHECK CUTTERS
3.20	4.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #5-7,10,12,29,31,33,35,42B.
4.00	4.30	LUNCH					
4.30	8.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE END CUTTER CHANGE
		-- SHIFT CHANGE------					
8.00	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #1-2,3-4,5-7,28,43A.
12.00	12.30	LUNCH					
12.30	13.35	MAINTENANCE		-	-	-	END CUTTER CHANGE
13.35	14.07	MINING		-	-	-	INCOMPLETE PUSH
14.07	14.10	DELAY					EXPAND RING #2002
14.10	14.25	MINING		1.50	3,4,9-24	11000	COMPLETED PUSH
14.25	14.35	RING INSTALLATION	2204				
14.35	14.55	MINING		-	-	-	INCOMPLETE PUSH
14.55	15.05	DELAY					INSTALL MESH & EXPAND RING #2003
15.05	15.25	DELAY					FIX PRIME PUMP HOSE(SUPPLY HEAD SPRAYS)
15.25	15.50	MINING		1.50	3,4,9-24	11000	COMPLETED PUSH
15.50	16.00	RING INSTALLATION	2205				
		-- SHIFT CHANGE------					
16.00	16.53	MINING		1.50	3,4,13-24	12000	-
16.53	17.02	RING INSTALLATION	2206				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 28,1984
Chainage :Start 3287.58 m
End 3304.58 m
Advance for day 17.00 m

File Name: DY11-28A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
17.02	17.19	MINING		-	-	-	INCOMPLETE PUSH
17.19	17.25	DELAY					STOP SCNDRY BELT(RETRIEVE IMPACT WRENCH SOCKET)
17.25	17.51	MINING		1.50	3,4,13-24	12000	COMPLETED PUSH
17.51	18.03	RING INSTALLATION	2207				
18.03	18.46	MINING		1.50	3,4,13-24	12000	-
18.46	18.56	RING INSTALLATION	2208				
18.56	19.48	MINING		1.50	3,4,13-24	12000	-
19.48	20.00	RING INSTALLATION	2209				
20.00	20.30	LUNCH					
20.30	21.28	MINING		1.50	3-16,21-24	10000	-
21.28	21.40	RING INSTALLATION	2210				
21.40	21.46	MINING		-	-	-	INCOMPLETE PUSH
21.46	21.51	DELAY					SECONDARY BELT SLIPPING
21.51	22.30	MINING		1.50	3-12,21-24	12000	COMPLETED PUSH
22.30	22.40	RING INSTALLATION	2211				
22.40	22.50	MINING		0.50	3-12,21-24	12000	INCOMPLETE PUSH
22.50	23.40	DELAY					SECONDARY BELT SLIPPING (NO TENSION)
23.40	24.00	DELAY					POWER TRIPPING OFF TO T.B.M. (NO ELECTRICIAN AVAILABLE)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: NOVEMBER 29,1984
Chainage: Start 3304.58 m
End 3327.68 m
Advance for day 23.10 m

File Name: DY11-29A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.36	DELAY					SECONDARY CONVEYOR SLIPPING
0.36	1.08	MINING		1.00	3-8,17-20	13500	COMPLETED PUSH
1.08	1.20	RING INSTALLATION	2212				
1.20	1.39	MINING		-	-	-	INCOMPLETE PUSH
1.39	1.54	DELAY					NO.1 & 2 MOTORS WONT START (SHUT DOWN)
1.54	2.07	MINING		-	-	-	INCOMPLETE PUSH
2.07	2.09	DELAY					INSTALL SPACERS
2.09	2.33	MINING		1.50	3-8,11,12, 17-24	10000	COMPLETED PUSH (6 MOTORS ONLY)
2.33	2.43	RING INSTALLATION	2213				
2.43	3.14	MINING		-	-	-	INCOMPLETE PUSH
3.14	3.16	DELAY					INSTALL SPACERS
3.16	3.46	MINING		1.50	3,4,11-24	10500	COMPLETED PUSH (6 MOTORS ONLY)
3.46	3.57	RING INSTALLATION	2214				
3.57	4.15	DELAY		-	-	-	FIX SWASH ON PRIMARY CONVEYOR
4.15	4.45	LUNCH & DELAY					CONTINUE SWASH REPAIR
4.45	4.52	DELAY		-	-	-	END SWASH REPAIR
4.52	5.26	MINING		-	-	-	INCOMPLETE PUSH (NO.2 MOTOR ON)
5.26	5.33	DELAY					SECONDARY CONVEYOR TRIPPED ACCIDENTLY
5.33	5.37	MINING		-	-	-	INCOMPLETE PUSH
5.37	5.39	DELAY					INSTALL SPACERS
5.39	5.50	MINING		1.50	3-8,14,16-24	13000	COMPLETED PUSH (7 MOTORS ONLY)
5.50	6.04	RING INSTALLATION	2215				
6.04	6.29	MINING		-	-	-	INCOMPLETE PUSH
6.29	6.31	DELAY					INSTALL SPACERS
6.31	6.49	MINING		1.50	3,4,12-24	10500	COMPLETED PUSH (7 MOTORS ONLY)
6.49	6.57	RING INSTALLATION	2216				
6.57	7.23	MINING		-	-	-	INCOMPLETE PUSH
7.23	7.24	DELAY					INSTALL SPACERS
7.24	7.48	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH (7 MOTORS ONLY)
7.48	8.00	RING INSTALLATION	2217				
		-- SHIFT CHANGE------					
8.00	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #21,37,42A,43B. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 29,1984 File Name: DY11-29A
Chainage :Start 3304.58 m
End 3327.68 m Project No: 831-6014
Advance for day 23.10 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
12.30	13.25	MAINTENANCE					END CUTTER CHANGE
13.25	13.50	MINING		-	-	-	INCOMPLETE PUSH
13.50	13.53	DELAY					EXPAND RING #2216
13.53	14.12	MINING		1.50	3-8,12-24	13000	COMPLETED PUSH (7 MOTORS ONLY)
14.12	14.20	RING INSTALLATION	2218				
14.20	14.45	MINING		-	-	-	INCOMPLETE PUSH
14.45	14.48	DELAY					EXPAND RING #2217
14.48	15.07	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH (7 MOTORS ONLY)
15.07	15.15	RING INSTALLATION	2219				
15.15	15.40	MINING		-	-	-	INCOMPLETE PUSH
15.40	15.43	DELAY					EXPAND RING #2218
15.43	16.00	MINING		1.10	3,4,9-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.17	MINING		0.40	3-12,17-24	12000	COMPLETED PUSH (7 MOTORS ONLY)
16.17	16.27	RING INSTALLATION	2220				
16.27	17.14	MINING		1.50	3-12,17-24	12000	(7 MOTORS ONLY)
17.14	17.24	RING INSTALLATION	2221				
17.24	18.20	MINING		1.50	3-12,17-24	12000	(7 MOTORS ONLY)
18.20	18.30	RING INSTALLATION	2222				
18.30	19.21	MINING		1.50	3-12,17-24	12000	(7 MOTORS ONLY)
19.21	19.35	RING INSTALLATION	2223				
19.35	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.02	MINING		1.50	3-12,17-24	12000	COMPLETED PUSH (7 MOTORS ONLY)
21.02	21.12	RING INSTALLATION	2224				
21.12	22.10	MINING		1.50	3-8,17-24	14000	(7 MOTORS ONLY)
22.10	22.20	RING INSTALLATION	2225				
22.20	23.10	MINING		1.50	3-8,17-24	14000	(7 MOTORS ONLY)
23.10	23.20	RING INSTALLATION	2226				
23.20	24.00	MINING		1.10	3-8,17-24	13000	INCOMPLETE PUSH (7 MOTORS ONLY)
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 30,1984
Chainage :Start 3327.68 m
End 3349.68 m
Advance for day 22.00 m

File Name: DY11-30A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.16	MINING		0.40	3,4,13-24	13000	COMPLETED PUSH
0.16	0.29	RING INSTALLATION	2227				
0.29	0.57	MINING		-	-	-	INCOMPLETE PUSH
0.57	0.58	DELAY					INSTALL SPACERS
0.58	1.18	MINING		1.50	3.5,4.5,13-24	12500	COMPLETED PUSH
1.18	1.29	RING INSTALLATION	2228				
1.29	1.55	DELAY					REPLACE DIODE IN CONTROLS FOR STARTING MOTORS (OUTSTATION NO. 3)
1.55	2.28	MINING		-	-	-	INCOMPLETE PUSH
2.28	2.30	DELAY					INSTALL SPACERS
2.30	2.46	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
2.46	2.56	RING INSTALLATION	2229				
2.56	3.23	MINING		-	-	-	INCOMPLETE PUSH
3.23	3.24	DELAY					INSTALL SPACERS
3.24	3.49	MINING		1.50	3,4,13-24	13000	COMPLETED PUSH
3.49	4.00	RING INSTALLATION	2230				
4.00	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.11	MINING		-	-	-	INCOMPLETE PUSH
5.11	5.13	DELAY					INSTALL SPACERS
5.13	5.27	MINING		1.50	3-8,17-24	13500	COMPLETED PUSH
5.27	5.37	RING INSTALLATION	2231				
5.37	6.07	MINING		-	-	-	INCOMPLETE PUSH
6.07	6.08	DELAY					INSTALL SPACERS
6.08	6.33	MINING		1.50	3-8,13-24	12000	COMPLETED PUSH
6.33	6.49	RING INSTALLATION	2232				
6.49	7.34	MINING		-	-	-	INCOMPLETE PUSH
7.34	7.36	DELAY					INSTALL SPACERS
7.36	7.40	MINING		-	-	-	INCOMPLETE PUSH
7.40	7.45	DELAY					SECONDARY CONVEYOR TRIPPED OUT
7.45	8.00	MINING		1.00	3,4,13-24	8500	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.20	MINING		-	-	-	INCOMPLETE PUSH
8.20	8.35	DELAY					MEASURE FOR SPECIAL SET OF THRUST BEAMS
8.35	8.40	MINING		0.50	3-8,12-24	12000	COMPLETED PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date NOVEMBER 30,1984
Chainage :Start 3327.68 m
End 3349.68 m
Advance for day 22.00 m

File Name: DY11-30A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.40	8.50	RING INSTALLATION	2233				
8.50	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #23,25,27,29,40,42B,43A
12.00	12.30	LUNCH					
12.30	13.10	MAINTENANCE		-	-	-	END CUTTER CHANGE ASSORTED MACHINE MAINTENANCE
13.10	13.40	MINING		-	-	-	INCOMPLETE PUSH
13.40	13.43	DELAY					EXPAND RING #2232
13.43	14.20	MINING		1.50	3-8,12-24	10000	COMPLETED PUSH
14.20	14.30	RING INSTALLATION	2234				
14.30	14.50	MINING		-	-	-	INCOMPLETE PUSH
14.50	15.00	DELAY					INSTALL MESH & EXPAND RING #2233
15.00	15.05	MINING		-	-	-	INCOMPLETE PUSH
15.05	15.15	DELAY					SECONDARY BELT SLIPPING
15.15	15.40	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
15.40	15.50	RING INSTALLATION	2235				
15.50	16.00	MINING		0.30	3,4,12-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.48	MINING		1.20	3,4,9-24	10000	COMPLETED PUSH
16.48	16.58	RING INSTALLATION	2236				
16.58	17.55	MINING		1.50	3,4,9-24	10000	-
17.55	18.10	RING INSTALLATION	2237				
18.10	19.15	MINING		1.50	3,4,9-24	10000	-
19.15	19.26	RING INSTALLATION	2238				SPECIAL SET
19.26	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.53	MINING		1.50	3,4,9-24	10000	COMPLETED PUSH
20.53	21.06	RING INSTALLATION	2239				
21.06	21.25	MINING		-	-	-	INCOMPLETE PUSH
21.25	21.30	DELAY					NO POWER(TRANSFORMER BUMPED ACCIDENTLY)
21.30	21.37	MINING		-	-	-	INCOMPLETE PUSH
21.37	21.44	DELAY					SECONDARY BELT SLIPPING
21.44	22.15	MINING		1.50	3,4,9-24	11000	COMPLETED PUSH
22.15	22.25	RING INSTALLATION	2240				
22.25	23.25	MINING		1.50	3,4,9-24	10000	-
23.25	23.37	RING INSTALLATION	2241				
23.37	24.00	MINING		0.60	3,4,9-24	10000	INCOMPLETE PUSH & SHIFT CHANGE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 01,1984
Chainage :Start 3349.68 m
End 3358.08 m
Advance for day 8.40 m

File Name: DY12-01A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.37	MINING		0.90	3-8,9-24	11000	COMPLETED PUSH
0.37	0.50	RING INSTALLATION	2242				
0.50	1.15	MINING		-	-	-	INCOMPLETE PUSH
1.15	1.18	DELAY					EXPAND RING #2241
1.18	1.50	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
1.50	2.00	RING INSTALLATION	2243				
2.00	3.25	MAINTENANCE		-	-	-	CHANGED CUTTER #37
3.25	3.50	MINING		-	-	-	INCOMPLETE PUSH
3.50	3.53	DELAY					EXPAND RING #2242
3.53	4.25	MINING		1.50	3-8,13,14, 21-24	14000	COMPLETED PUSH
4.25	4.55	LUNCH					
4.55	5.05	RING INSTALLATION	2244				
5.05	5.30	MINING		-	-	-	INCOMPLETE PUSH
5.30	5.33	DELAY					EXPAND RING #2243
5.33	6.03	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
6.03	6.10	RING INSTALLATION	2245				
6.10	6.40	MINING		-	-	-	INCOMPLETE PUSH
6.40	6.43	DELAY					EXPAND RING #2244
6.43	7.08	MINING		1.50	3,4,11-24	14000	COMPLETED PUSH
7.08	7.17	RING INSTALLATION	2246				
7.17	7.40	MINING		-	-	-	INCOMPLETE PUSH
7.40	7.43	DELAY					EXPAND RING #2245
7.43	8.00	MINING		-	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.10	MINING		1.50	3,4,12-24	14000	COMPLETED PUSH
8.10	8.45	RING INSTALLATION	2247				INSTRUMENTATION SET
8.45	9.00	MINING		0.30	3,4,12-24	14000	INCOMPLETE PUSH
9.00	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS
12.00	12.30	LUNCH					
12.30	14.30	MAINTENANCE		-	-	-	END CUTTER CHANGE
14.30	16.00	MAINTENANCE		-	-	-	ASSORTED MACHINE MAINTENANCE
		-- SHIFT CHANGE------					END OF DAY'S WORK, WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 02,1984 File Name: DY12-02A
Chainage :Start 3358.45 m REVISED
End 3364.45 m REVISED Project No: 831-6014
Advance for day 6.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	16.00	NO WORK CARRIED OUT					WEEKEND
16.00	16.35	-- SHIFT CHANGE------					PICK UP MATERIAL @ DIESEL GARAGE
16.35	16.55	DELAY		-	-	-	WARM UP T.B.M., SET UP LAZER TARGET
16.55	17.20	MINING		-	-	-	INCOMPLETE PUSH
17.20	17.23	DELAY					EXPAND RING #2246
17.23	17.55	MINING		1.20	3,4,9-24	13000	COMPLETED PUSH
17.55	18.05	RING INSTALLATION	2248				
18.05	18.30	MINING		-	-	-	INCOMPLETE PUSH
18.30	18.35	DELAY					INSTALL MESH & EXPAND RING #2247
18.35	19.00	MINING		-	-	-	INCOMPLETE PUSH
19.00	20.00	DELAY					POWER TROUBLE (SCRUBBER KICKING OFF)
20.00	20.30	LUNCH					
20.30	21.45	DELAY					POWER TROUBLE (TRANSDUCER RELAY UNIT)
21.45	21.50	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
21.50	22.00	RING INSTALLATION	2249				
22.00	22.25	MINING		-	-	-	INCOMPLETE PUSH
22.25	22.30	DELAY					INSTALL MESH & EXPAND RING #2248
22.30	22.48	MINING		1.50	3-24	13000	COMPLETED PUSH
22.48	22.57	RING INSTALLATION	2250				
22.57	23.20	MINING		-	-	-	INCOMPLETE PUSH
23.20	23.23	DELAY					EXPAND RING #2249
23.23	23.43	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
23.43	23.50	RING INSTALLATION	2251				
23.50	24.00	MINING		0.30	3,4,12-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 03,1984 File Name: DY12-03A
Chainage :Start 3364.45 m
End 3383.65 m REVISED Project No: 831-6014
Advance for day 19.20 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.28	-- SHIFT CHANGE------					
0.28	0.43	MINING		-	-	-	INCOMPLETE PUSH
0.43	0.45	DELAY					INSTALL SPACERS
0.45	1.01	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
1.01	1.11	RING INSTALLATION	2252				
1.11	1.43	MINING		-	-	-	INCOMPLETE PUSH
1.43	1.45	DELAY					INSTALL SPACERS
1.45	2.10	MINING		1.50	3-8,13-24	11000	COMPLETED PUSH
2.10	2.22	RING INSTALLATION	2253				
2.22	2.48	MINING		-	-	-	INCOMPLETE PUSH
2.48	3.45	DELAY					NO.1 & 2 MOTORS RELAY UNIT CUTTING OUT
3.45	4.07	MINING		1.50	9-24	15000	COMPLETED PUSH
4.07	4.18	RING INSTALLATION	2254				
4.18	4.35	DELAY		-	-	-	T.B.M. CUTTING OUT(NO.7 & 8 CONTACTOR INDICATOR)
4.35	5.05	LUNCH & DELAY		-	-	-	WORK ON NO.1 & 2 MOTOR RELAYS
5.05	7.05	DELAY		-	-	-	REPLACE LOGIC CARD AT NO.3 OUTSTATION
7.05	7.13	MINING		0.30	3,4,9-24	13000	INCOMPLETE PUSH(NO.3&4 MOTORS SHUT OFF)
7.13	8.00	DELAY		-	-	-	T.B.M. CUTTING OUT(STARTING SEQUENCE NOT CORRECT)
		-- SHIFT CHANGE------					
8.00	9.18	DELAY		-	-	-	WORK ON STARTING SEQUENCE
9.18	9.59	MINING		1.20	3,4,13-24	12500	COMPLETED PUSH
9.59	10.08	RING INSTALLATION	2255				
10.08	10.47	MINING		1.50	3,4,13-24	13000	-
10.47	10.56	RING INSTALLATION	2256				
10.56	11.49	MINING		1.50	3,4,12-24	11500	-
11.49	12.00	RING INSTALLATION	2257				
12.00	12.30	LUNCH					
12.30	15.20	MAINTENANCE		-	-	-	CHANGED CUTTERS #22,39,41,42A,43B. ASSORTED MACHINE MAINTENANCE
15.20	15.41	MAINTENANCE		-	-	-	START UP BELT (AFTER REPLACING "SNUB PULLEY ON NO.1 HEADFRAME)
15.41	16.00	MINING		0.80	3,4,12-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.20	MINING		0.70	3,4,12-24	13000	COMPLETED PUSH
16.20	16.30	RING INSTALLATION	2258				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 03,1984
Chainage :Start 3364.45 m
End 3383.65 m REVISED
Advance for day 19.20 m

File Name: DY12-03A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
16.30	16.57	MINING		-	-	-	INCOMPLETE PUSH
16.57	17.00	DELAY					EXPAND RING #2257
17.00	17.23	MINING		1.50	3-24	13000	COMPLETED PUSH
17.23	17.30	RING INSTALLATION	2259				
17.30	17.57	MINING		-	-	-	INCOMPLETE PUSH
17.57	18.00	DELAY					EXPAND RING #2258
18.00	18.17	MINING		1.50	3-11,17-24	13000	COMPLETED PUSH
18.17	18.25	RING INSTALLATION	2260				
18.25	18.50	MINING		-	-	-	INCOMPLETE PUSH
18.50	18.53	DELAY					EXPAND RING #2259
18.53	19.14	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
19.14	19.22	RING INSTALLATION	2261				
19.22	19.30	MAINTENANCE		-	-	-	CHECK CUTTERS (O.K.)
19.30	19.55	MINING		-	-	-	INCOMPLETE PUSH
19.55	19.58	DELAY					EXPAND RING #2260
19.58	20.15	MINING		-	-	-	INCOMPLETE PUSH
20.15	20.45	LUNCH					
20.45	20.55	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
20.55	21.05	RING INSTALLATION	2262				
21.05	21.30	MINING		-	-	-	INCOMPLETE PUSH
21.30	21.33	DELAY					EXPAND RING #2261
21.33	21.58	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
21.58	22.07	RING INSTALLATION	2263				
22.07	22.27	MINING		-	-	-	INCOMPLETE PUSH
22.27	22.30	DELAY					EXPAND RING #2262
22.30	22.53	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
22.53	23.00	RING INSTALLATION	2264				
23.00	24.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #35,38.
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 04,1984
Chainage :Start 3383.65 m
End 3403.15 m
Advance for day 19.50 m

File Name: DY12-04A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.15	MAINTENANCE		-	-	-	TIGHTEN CUTTER BOLTS
0.15	0.51	MINING		-	-	-	INCOMPLETE PUSH
0.51	0.53	DELAY					INSTALL SPACERS
0.53	1.08	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
1.08	1.20	RING INSTALLATION	2265				
1.20	1.51	MINING		-	-	-	INCOMPLETE PUSH
1.51	1.53	DELAY					INSTALL SPACERS
1.53	2.20	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
2.20	2.33	RING INSTALLATION	2266				
2.33	2.43	MAINTENANCE					CHECK CUTTERS (RE-TORQUE 2 CUTTERS)
2.43	3.10	MINING		-	-	-	INCOMPLETE PUSH
3.10	3.12	DELAY					INSTALL SPACERS
3.12	3.40	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
3.40	3.50	RING INSTALLATION	2267				
3.50	4.05	MINING					
4.05	4.35	LUNCH					
4.35	5.01	MINING		-	-	-	INCOMPLETE PUSH
5.01	5.03	DELAY					INSTALL SPACERS
5.03	5.21	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
5.21	5.32	RING INSTALLATION	2268				
5.32	5.45	MAINTENANCE					CHECK CUTTERS
5.45	6.15	MINING		-	-	-	INCOMPLETE PUSH
6.15	6.17	DELAY					INSTALL SPACERS
6.17	6.41	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
6.41	6.52	RING INSTALLATION	2269				
6.52	6.57	MINING		-	-	-	
6.57	7.24	DELAY		-	-	-	BACK UP SKID CAUGHT IN ROLLER
7.24	7.46	MINING		-	-	-	INCOMPLETE PUSH
7.46	7.48	DELAY					INSTALL SPACERS
7.48	8.00	MINING		1.20	3-8,13-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.12	MINING		0.30	3-8,13-24	13000	COMPLETED PUSH
8.12	11.00	MAINTENANCE & DELAY					CHANGED CUTTERS #15,16,18,42B,43A. ASSORTED MACHINE MAINTENANCE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 04,1984 File Name: DY12-04A
Chainage :Start 3383.65 m
End 3403.15 m Project No: 831-6014
Advance for day 19.50 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		MAINTENANCE CONT'D		-	-	-	DRILLED OFF AN INSTRUMENTATION HOLE IN THE ROOF (RING #2268-2269)
11.00	12.00	DELAY		-	-	-	COMPLETE INSTRUMENTATION HOLE
12.00	12.30	LUNCH					
12.30	12.44	RING INSTALLATION	2270				
12.44	13.38	MINING		1.50	3-8,11,13-24	13000	-
13.38	13.50	RING INSTALLATION	2271				
13.50	14.39	MINING		1.50	3-8,11-16,17.5-20.5,21-24	11500	-
14.39	14.50	RING INSTALLATION	2272				
14.50	15.44	MINING		1.50	3,4,11-24	15000	-
15.44	15.56	RING INSTALLATION	2273				
15.56	16.00	MINING		-	-	-	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.30	MINING		-	-	-	INCOMPLETE PUSH
16.30	16.33	DELAY					EXPAND RING #2272
16.33	17.00	MINING		1.50	3-24	13000	COMPLETED PUSH
17.00	17.10	RING INSTALLATION	2274				
17.10	20.15	MAINTENANCE		-	-	-	CHANGED CUTTERS #17,30,37,42A. ASSORTED MACHINE MAINTENANCE
20.15	20.45	LUNCH					
20.45	21.20	MINING		-	-	-	INCOMPLETE PUSH
21.20	21.23	DELAY					EXPAND RING #2273
21.23	21.40	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
21.40	21.50	RING INSTALLATION	2275				
21.50	22.00	DELAY					REPAIR OIL LEAK (NO.12 HYDRLC. MOTOR)
22.00	22.30	MINING		-	-	-	INCOMPLETE PUSH
22.30	22.33	DELAY					EXPAND RING #2274
22.33	22.53	MINING		1.50	3,4,12-24	13000	COMPLETED PUSH
22.53	23.00	RING INSTALLATION	2276				
23.00	23.27	MINING		-	-	-	INCOMPLETE PUSH
23.27	23.30	DELAY					EXPAND RING #2275
23.30	23.50	MINING		1.50	3,4,11-24	13000	COMPLETED PUSH
23.50	24.00	RING INSTALLATION	2277				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 05,1984 File Name: DY12-05A
Chainage :Start 3403.15 m
End 3424.15 m Project No: 831-6014
Advance for day 21.00 m

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	1.40	MAINTENANCE		-	-	-	TIGHTEN CUTTER BOLTS(2 MISSING BLOCKS)
1.40	2.03	MINING		-	-	-	INCOMPLETE PUSH
2.03	2.05	DELAY					INSTALL SPACERS
2.05	2.30	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
2.30	2.40	RING INSTALLATION	2278				
2.40	3.08	MINING		-	-	-	INCOMPLETE PUSH
3.08	3.10	DELAY					INSTALL SPACERS
3.10	3.35	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
3.35	3.45	RING INSTALLATION	2279				
3.45	4.05	MAINTENANCE					TIGHTEN CUTTER BOLTS(1 MISSING BLOCK)
4.05	4.35	LUNCH					
4.35	5.11	MINING		-	-	-	INCOMPLETE PUSH
5.11	5.13	DELAY					INSTALL SPACERS
5.13	5.36	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
5.36	5.46	RING INSTALLATION	2280				
5.46	6.11	MINING		-	-	-	INCOMPLETE PUSH
6.11	6.13	DELAY					INSTALL SPACERS
6.13	6.46	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
6.46	6.56	RING INSTALLATION	2281				
6.56	7.21	MAINTENANCE					TIGHTEN CUTTER BOLTS
7.21	7.51	MINING		-	-	-	INCOMPLETE PUSH
7.51	7.57	DELAY					INSTALL SPACERS
7.57	8.00	MINING		1.10	3,4,9-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.14	MINING		0.40	3,4,9-24	12000	COMPLETED PUSH
8.14	11.15	MAINTENANCE		-	-	-	CHANGED CUTTERS 014,16,42B,43A.
							ASSORTED MACHINE MAINTENANCE
11.15	11.45	MAINTENANCE		-	-	-	INSTALL FAN, START BELTS
11.45	12.00	RING INSTALLATION	2282				
12.00	12.30	LUNCH					
12.30	12.39	DELAY					RE-START SECONDARY CONVEYOR
12.39	13.30	MINING		1.50	3-8,12-24	14000	-
13.30	13.42	RING INSTALLATION	2283				
13.42	13.50	DELAY					NO.1 BELT LINE STOPPED
13.50	14.07	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: DECEMBER 05,1984 — File Name: DY12-05A
Chainage: Start 3403.15 m
End 3424.15 m — Project No: 831-6014
Advance for day 21.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
14.07	14.11	DELAY					INSTALL MESH
14.11	14.47	MINING		1.50	3-8,12-24	11000	COMPLETED PUSH
14.47	14.59	RING INSTALLATION	2284				
14.59	15.03	MAINTENANCE					CHECK CUTTERS & BLOCKS
15.03	15.59	MINING		1.50	3,4,11-24	11500	-
15.59	16.00	RING INSTALLATION	2285				PARTIAL INSTALLATION
		-- SHIFT CHANGE------					
16.00	16.11	RING INSTALLATION	2285				COMPLETE INSTALLATION
16.11	16.40	MINING		-	-	-	INCOMPLETE PUSH
16.40	16.43	DELAY					EXPAND RING #2284
16.43	17.08	MINING		1.50	3,4,9-24	15000	COMPLETED PUSH
17.08	17.16	RING INSTALLATION	2286				
17.16	17.40	MINING		-	-	-	INCOMPLETE PUSH
17.40	17.43	DELAY					EXPAND RING #2285
17.43	18.15	MINING		1.50	3,4,9-24	15000	COMPLETED PUSH
18.15	18.25	RING INSTALLATION	2287				
18.25	18.55	MINING		-	-	-	INCOMPLETE PUSH
18.55	18.58	DELAY					EXPAND RING #2286
18.58	19.25	MINING		1.50	3,4,9-24	15000	COMPLETED PUSH
19.25	19.35	RING INSTALLATION	2288				
19.35	20.05	MINING		-	-	-	INCOMPLETE PUSH
20.05	20.08	DELAY					EXPAND RING #2287
20.08	20.30	MINING		1.50	3-8,12-24	15000	COMPLETED PUSH
20.30	21.00	LUNCH					
21.00	21.10	RING INSTALLATION	2289				
21.10	21.40	MINING		-	-	-	INCOMPLETE PUSH
21.40	21.43	DELAY					EXPAND RING #2288
21.43	22.10	MINING		1.50	3-8,12-24	15000	COMPLETED PUSH
22.10	22.20	RING INSTALLATION	2290				
22.20	22.50	MINING		-	-	-	INCOMPLETE PUSH
22.50	22.53	DELAY					EXPAND RING #2289
22.53	23.16	MINING		1.50	3,4,12-24	15000	COMPLETED PUSH
23.16	23.25	RING INSTALLATION	2291				
23.25	24.00	MAINTENANCE		-	-	-	RE-TORQUE CUTTER BOLTS
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date: DECEMBER 06,1984
Chainage: Start 3424.15 m
End 3446.65 m
Advance for day 22.50 m

File Name: DY12-06A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.35	MINING		-	-	-	INCOMPLETE PUSH
0.35	0.37	DELAY					INSTALL SPACERS
0.37	1.02	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
1.02	1.17	RING INSTALLATION	2292				
1.17	1.40	MINING		-	-	-	INCOMPLETE PUSH
1.40	2.12	DELAY					FIX SEVERED HYDRLC. LINE (NO.4 PUMP)
							CHECK & TIGHTEN CUTTERS
2.12	2.18	MINING		-	-	-	INCOMPLETE PUSH
2.18	2.20	DELAY					INSTALL SPACERS
2.20	2.48	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
2.48	3.01	RING INSTALLATION	2293				
3.01	3.30	MINING		-	-	-	INCOMPLETE PUSH
3.30	3.32	DELAY					INSTALL SPACERS
3.32	3.53	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
3.53	4.03	RING INSTALLATION	2294				
4.03	4.25	MAINTENANCE					CHECK & TIGHTEN CUTTERS
4.25	4.55	LUNCH					
4.55	5.32	MINING		-	-	-	INCOMPLETE PUSH
5.32	5.34	DELAY					INSTALL SPACERS
5.34	5.57	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
5.57	6.10	RING INSTALLATION	2295				
6.10	6.35	MINING		-	-	-	INCOMPLETE PUSH
6.35	6.37	DELAY					INSTALL SPACERS
6.37	7.10	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
7.10	7.20	RING INSTALLATION	2296				
7.20	7.37	MAINTENANCE					CHECK & TIGHTEN CUTTERS
7.37	8.00	MINING		0.70	3,4,9-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.18	MINING		-	-	-	INCOMPLETE PUSH
8.18	11.10	MAINTENANCE		-	-	-	CHANGED CUTTERS #5-7,12,42A,43B.
							ASSORTED MACHINE MAINTENANCE
11.10	11.48	DELAY		-	-	-	WAIT FOR STARTUP OF MAIN BELTS
11.48	11.59	MINING					
11.59	12.29	LUNCH		0.80	3-8,13-24	10000	COMPLETED PUSH
12.29	12.41	RING INSTALLATION	2297				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 06,1984
Chainage :Start 3424.15 m
End 3446.65 m
Advance for day 22.50 m

File Name: DY12-06A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
12.41	13.00	DELAY					SWITCH GEAR HEALTHY "RED LIGHT ON" (ISOLATE NO.5 & 6 MOTORS)
13.00	13.48	MINING		-	-	-	INCOMPLETE PUSH (6 MOTORS ONLY)
13.48	13.58	DELAY					NO.1 BELT LINE SLIP (RESET ALL DRIVES)
13.58	14.14	MINING		1.50	3-8,13-24	8500	COMPLETED PUSH (8 MOTORS ONLY)
14.14	14.25	RING INSTALLATION	2298				
14.25	14.30	MAINTENANCE					RE-TORQUED 6 CUTTERS
14.30	15.24	MINING		1.50	3-8,12-16, 21-24	12500	-
15.24	15.37	RING INSTALLATION	2299				
15.37	15.46	DELAY					REPAIR WATER LINE (SANDPIPER PUMP)
15.46	16.00	MINING		0.50	3-8,13-16, 21-24	10500	INCOMPLETE PUSH
		-- SHIFT CHANGE--					
16.00	16.40	MINING		1.00	3-8,12-24	11000	COMPLETED PUSH
16.40	16.50	RING INSTALLATION	2300				
16.50	16.58	MAINTENANCE					CHECK CUTTERS & WATER SPRAYS
16.58	17.25	MINING		-	-	-	INCOMPLETE PUSH
17.25	17.28	DELAY					EXPAND RING #2299
17.28	17.53	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
17.53	18.00	RING INSTALLATION	2301				
18.00	18.27	MINING		-	-	-	INCOMPLETE PUSH
18.27	18.30	DELAY					EXPAND RING #2300
18.30	18.50	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
18.50	19.00	RING INSTALLATION	2302				
19.00	19.30	MINING		-	-	-	INCOMPLETE PUSH
19.30	19.33	DELAY					EXPAND RING #2301
19.33	19.53	MINING		1.50	3,4,12-24	11000	COMPLETED PUSH
19.53	20.00	RING INSTALLATION	2303				
20.00	20.15	DELAY					SMOKE DETECTOR TRIPPED OUT (NO.2 CONVEYOR) WET CONNECTOR
20.15	20.45	LUNCH					
20.45	21.15	MINING		-	-	-	INCOMPLETE PUSH
21.15	21.18	DELAY					EXPAND RING #2302
21.18	21.45	MINING		1.50	3,4,11-24	12000	COMPLETED PUSH
21.45	21.55	RING INSTALLATION	2304				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel B 2)

Date DECEMBER 06,1984
Chainage :Start 3424.15 m
End 3446.65 m
Advance for day 22.50 m

File Name: DY12-06A

Project No: 831-6014

Time (hours) Start	End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.55	22.25	MINING		-	-	-	INCOMPLETE PUSH
22.25	22.28	DELAY					EXPAND RING #2303
22.28	22.50	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
22.50	23.00	RING INSTALLATION	2305				
23.00	23.30	MINING		-	-	-	INCOMPLETE PUSH
23.30	23.33	DELAY					EXPAND RING #2304
23.33	23.50	MINING		1.50	3,4,12-24	12000	COMPLETED PUSH
23.50	24.00	RING INSTALLATION	2306				
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 07,1984
Chainage :Start 3446.65 m
End 3457.76 m
Advance for day 11.11 m

File Name: DY12-07A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.30	MINING		-	-	-	INCOMPLETE PUSH
0.30	0.32	DELAY					INSTALL SPACERS
0.32	0.56	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
0.56	1.06	RING INSTALLATION	2307				
1.06	1.31	MAINTENANCE					CHECK & TIGHTEN CUTTERS,RE-SEAT GREASE SEAL
1.31	2.08	MINING		-	-	-	INCOMPLETE PUSH
2.08	2.10	DELAY					INSTALL SPACERS
2.10	2.22	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
2.22	2.35	RING INSTALLATION	2308				
2.35	3.35	MAINTENANCE		-	-	-	CHANGED & TIGHTEN CUTTERS
3.35	4.05	LUNCH					
4.05	4.40	MINING		-	-	-	INCOMPLETE PUSH
4.40	4.42	DELAY					INSTALL SPACERS
4.42	5.02	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
5.02	5.12	RING INSTALLATION	2309				
5.12	5.35	MINING		-	-	-	INCOMPLETE PUSH
5.35	5.37	DELAY					INSTALL SPACERS
5.37	6.09	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
6.09	6.14	RING INSTALLATION	2310				
6.14	7.09	MAINTENANCE		-	-	-	CHECK & TIGHTEN CUTTERS,REPLACE BROKEN BOLTS & MISSING BLOCKS
7.09	7.45	MINING		-	-	-	INCOMPLETE PUSH
7.45	7.47	DELAY					INSTALL SPACERS
7.47	8.00	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
		-- SHIFT CHANGE------					
8.00	8.10	RING INSTALLATION	2311				
8.10	8.44	MINING		-	-	-	INCOMPLETE PUSH
8.44	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,22,42B,43A. ASSORTED MACHINE MAINTENANCE SET UP & DRILLED HARBOUR SEAM LOCATION HOLE IN HEAD
12.00	12.50	MAINTENANCE		-	-	-	REMOVE BROKEN BOLT FROM CENTRE CUTTER
12.50	13.08	DELAY		-	-	-	WAIT FOR STARTUP OF MAIN BELTS
13.08	13.19	MINING		-	-	-	INCOMPLETE PUSH
13.19	13.23	DELAY		-	-	-	PRMRY CONVEYOR STOPPED(MUCK CONGESTION)

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 07,1984 File Name: DY12-07A
Chainage :Start 3446.65 m
End 3457.76 m Project No: 831-6014
Advance for day 11.11 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
13.23	13.33	MINING		1.50	3,4,11-24	13500	COMPLETED PUSH
13.33	13.44	RING INSTALLATION	2312				
13.44	13.58	MINING		-	-	-	INCOMPLETE PUSH
13.58	14.02	DELAY					SECONDARY CONVEYOR TRIPPED OUT
14.02	14.08	MINING		-	-	-	INCOMPLETE PUSH
14.08	14.13	DELAY					INSTALL MESH
14.13	14.37	MINING		1.50	3,4,5.5-8,5, 13-24	10000	COMPLETED PUSH
14.37	14.51	RING INSTALLATION	2313				
14.51	15.09	MINING		-	-	-	INCOMPLETE PUSH
15.09	15.12	DELAY					INSTALL MESH
15.12	15.30	MINING		1.10	3-8,11,12,13-16,21-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------		-	-	-	WORKED THROUGH LUNCH TO FINISH SHIFT 1/2 HOUR EARLY
							END OF DAY'S WORK,WEEKEND

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY12-10A

Date DECEMBER 10,1984
Chainage :Start 3457.76 m
End 3467.96 m
Advance for day 10.20 m

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.25	-- SHIFT CHANGE------					
8.25	9.00	DELAY		-	-	-	WARM UP T.B.M.
9.00	10.30	DELAY		-	-	-	DRILL INSTRUMENTATION HOLE AT FACE
10.30	11.15	DELAY		-	-	-	INSTALL INSTRUMENTATION RODS (GOLDERS)
11.15	12.00	MAINTENANCE		-	-	-	INSPECT & TIGHTEN CUTTERS #15,17,39,41.
12.00	12.30	LUNCH					
12.30	12.50	MAINTENANCE		-	-	-	END INSPECT & TIGHTEN CUTTERS
12.50	13.00	DELAY					NO.7 & 8 MOTORS NOT STARTING
13.00	13.22	MINING		0.40	3-8,13-24	12000	COMPLETED PUSH
13.22	13.32	RING INSTALLATION	2314				
13.32	14.25	MINING		1.50	3-12,17-24	13000	-
14.25	14.32	RING INSTALLATION	2315				
14.32	15.23	MINING		1.50	3-12,17-24	13000	-
15.23	15.30	RING INSTALLATION	2316				
15.30	16.00	MAINTENANCE		-	-	-	INSPECT & TIGHTEN CUTTERS, REPLACE MISSING BLOCK ON NO.37 CUTTER
		-- SHIFT CHANGE------					
16.00	16.20	MINING		-	-	-	INCOMPLETE PUSH
16.20	16.32	DELAY					3H.P. FACE WATER PUMP TRIPPED OUT
16.32	16.37	DELAY					SWASH TROUBLE (T.B.M. WOULDN'T START)
16.37	16.59	MINING		-	-	-	INCOMPLETE PUSH
16.59	17.01	DELAY					INSTALL SPACERS
17.01	17.27	MINING		1.50	3,4,11-24	10500	COMPLETED PUSH
17.27	17.39	RING INSTALLATION	2317				CHECK CUTTERS & GAS
17.39	18.05	MINING		-	-	-	INCOMPLETE PUSH
18.05	18.07	DELAY					INSTALL SPACERS
18.07	18.17	MINING		1.50	3,4,11-24	11000	COMPLETED PUSH
18.17	18.30	RING INSTALLATION	2318				
18.30	18.45	MAINTENANCE					RE-TORQUE 5 CUTTERS
18.45	19.11	MINING		-	-	-	INCOMPLETE PUSH
19.11	19.13	DELAY					INSTALL SPACERS
19.13	19.22	MINING		1.00	3,4,11-24	10500	COMPLETED PUSH
19.22	19.35	RING INSTALLATION	2319				
19.35	19.57	MINING		-	-	-	INCOMPLETE PUSH
19.57	19.58	DELAY					INSTALL SPACERS

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 10,1984
Chainage :Start 3457.76 m
End 3467.96 m
Advance for day 10.20 m

File Name: DY12-10A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.58	20.19	MINING		1.00	3,4,12-24	10500	COMPLETED PUSH
20.19	20.30	RING INSTALLATION	2320				
20.30	20.45	MAINTENANCE		-	-	-	RE-TORQUE 5 CUTTERS
20.45	21.15	LUNCH					
21.15	21.40	DELAY		-	-	-	NO.4 BELT NOT OPERATING
21.40	22.05	MINING		-	-	-	INCOMPLETE PUSH
22.05	22.09	DELAY					INSTALL SPACERS
22.09	22.21	MINING		1.00	3,4,12-24	11000	COMPLETED PUSH
22.21	22.32	RING INSTALLATION	2321				
23.32	22.36	DELAY					
22.36	22.59	MINING		-	-	-	INCOMPLETE PUSH
22.59	23.10	DELAY					INSTALL SPACERS
23.10	23.28	MINING		1.00	3,4,11-24	11500	COMPLETED PUSH
23.28	23.43	RING INSTALLATION	2322				
23.43	23.51	MAINTENANCE		-	-	-	RE-TORQUE 3 CUTTERS
							CHECK CUTTERS & GAS
23.51	24.00	MINING		0.30	3,4,11-24	13000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 11,1984
Chainage :Start 3467.96 m
End 3484.46 m
Advance for day 16.50 m

File Name: DY12-11A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.12	MINING		-	-	-	INCOMPLETE PUSH
0.12	0.15	DELAY					EXPAND RING #2321
0.15	0.30	MINING		0.70	3,4,9-24	13000	COMPLETED PUSH
0.30	0.40	RING INSTALLATION	2323				
0.40	1.00	MINING		-	-	-	INCOMPLETE PUSH
1.00	1.03	DELAY					EXPAND RING #2322
1.03	1.17	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
1.17	1.30	RING INSTALLATION	2324				
1.30	1.50	MINING		-	-	-	INCOMPLETE PUSH
1.50	1.53	DELAY					EXPAND RING #2323
1.53	2.08	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
2.08	2.20	RING INSTALLATION	2325				
2.20	2.30	DELAY					POWER TRIPPED OUT(LIGHTING TRANSFORMER)
2.30	2.50	MINING		-	-	-	INCOMPLETE PUSH
2.50	2.53	DELAY					EXPAND RING #2324
2.53	3.06	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
3.06	3.16	RING INSTALLATION	2326				
3.16	3.27	MAINTENANCE					CHECK CUTTERS
3.27	3.47	MINING		-	-	-	INCOMPLETE PUSH
3.47	3.50	DELAY					EXPAND RING #2325
3.50	4.20	LUNCH					
4.20	5.15	DELAY					SECONDARY BELT SLIPPING
5.15	5.30	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
5.30	5.43	RING INSTALLATION	2327				
5.43	6.03	MINING		-	-	-	INCOMPLETE PUSH
6.03	6.06	DELAY					EXPAND RING #2326
6.06	6.20	MINING		-	-	-	INCOMPLETE PUSH
6.20	6.35	DELAY					SECONDARY BELT SLIPPING
6.35	6.40	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
6.40	6.50	RING INSTALLATION	2328				
6.50	7.10	MINING		-	-	-	INCOMPLETE PUSH
7.10	7.13	DELAY					EXPAND RING #2327
7.13	7.30	DELAY					SECONDARY BELT SLIPPING
7.30	7.50	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
7.50	8.00	RING INSTALLATION	2329				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 11,1984 File Name: DY12-11A
Chainage :Start 3467.96 m
End 3484.46 m Project No: B31-6014
Advance for day 16.50 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
8.00	8.15	MINING		-	-	-	INCOMPLETE PUSH
8.15	8.25	DELAY					NO.4 BELT SLIPPING
8.25	8.40	MINING		-	-	-	INCOMPLETE PUSH
8.40	9.22	DELAY					INSTALL MESH & EXPAND RING #2328
9.22	9.34	MINING		1.00	3-20	16000	COMPLETED PUSH
9.34	9.48	RING INSTALLATION	2330				
9.48	10.10	MINING		0.60	3-20	16000	INCOMPLETE PUSH (BAD ROOF)
10.10	10.20	RING INSTALLATION	2331				BUILT RING #2331 INSIDE SHIELD
10.20	10.35	MINING		-	-	-	INCOMPLETE PUSH
10.35	10.45	DELAY					EXPAND RING #2329
10.45	11.03	MINING		1.00	3-20	15000	COMPLETED PUSH
11.03	11.15	RING INSTALLATION	2332				
11.15	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #20,21,26,29,37,42B,43A; ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	15.40	MAINTENANCE		-	-	-	END CUTTER CHSNGE
15.40	15.53	MINING		0.30	3-20	15000	COMPLETED PUSH (BAD ROOF)
15.53	16.00	DELAY					NO.4 BELT SLIPPING
		-- SHIFT CHANGE------					
16.00	16.55	DELAY					TROUBLE WITH SEQUENCE ROLLERS FOR NO.4 BELT & SECONDARY CONVEYOR
16.55	17.25	MINING		-	-	-	INCOMPLETE PUSH
17.25	17.32	DELAY					INSTALL SPACERS
17.32	17.47	MINING		1.10	3-8,11,12,14, 16-24	15000+	COMPLETED PUSH
17.47	18.00	RING INSTALLATION	2333				
18.00	18.24	MINING		-	-	-	INCOMPLETE PUSH
18.24	18.27	DELAY					INSTALL SPACERS
18.27	18.37	MINING		-	-	-	INCOMPLETE PUSH
18.37	18.42	DELAY					SECONDARY CONVEYOR SLIPPING
18.42	18.47	MINING		1.00	3-8,11-24	15000	COMPLETED PUSH
18.47	19.01	RING INSTALLATION	2334				
19.01	19.16	MAINTENANCE					
19.16	19.18	MINING		-	-	-	INCOMPLETE PUSH
19.18	19.20	DELAY					PRIMARY CONVEYOR STOPPED

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 11,1984
Chainage :Start 3467.96 m
End 3484.46 m
Advance for day 16.50 m

File Name: DY12-11A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
19.20	19.40	MINING		-	-	-	INCOMPLETE PUSH
19.40	19.44	DELAY					INSTALL SPACERS
19.44	19.54	MINING		1.00	3-8,11,12,14, 16-24	15000	COMPLETED PUSH
19.54	20.08	RING INSTALLATION	2335				
20.08	20.20	MINING		-	-	-	INCOMPLETE PUSH
20.20	20.50	LUNCH					
20.50	21.03	MINING		-	-	-	INCOMPLETE PUSH
21.03	21.05	DELAY					INSTALL SPACERS
21.05	21.16	MINING		1.00	3-8,11,12,14, 16-24	15000	COMPLETED PUSH
21.16	21.30	RING INSTALLATION	2336				
21.30	21.47	MAINTENANCE		-	-	-	RE-TORQUE 5 CUTTERS, CHECK FOR GAS
21.47	22.14	MINING		-	-	-	INCOMPLETE PUSH
22.14	22.16	DELAY					INSTALL SPACERS
22.16	22.27	MINING		1.00	3-8,11,12,14, 16-24	15000	COMPLETED PUSH
22.27	22.40	RING INSTALLATION	2337				
22.40	23.06	MINING		-	-	-	INCOMPLETE PUSH
23.06	23.09	DELAY					INSTALL SPACERS
23.09	23.17	MINING		1.00	3-8,11,12,14, 16-24	13000+	COMPLETED PUSH
23.17	23.30	RING INSTALLATION	2338				
23.30	23.56	MINING		0.80	3-8,11,12,14, 16-24	13000	INCOMPLETE PUSH
23.56	24.00	DELAY					INSTALL SPACERS
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 12,1984 File Name: DY12-12A
Chainage :Start 3484.46 m
End 3505.26 m Project No: 831-6014
Advance for day 20.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.04	DELAY					EXPAND RING #2337
0.04	0.11	MINING		0.20	3-8,12-24	13000	COMPLETED PUSH
0.11	0.28	RING INSTALLATION	2339				
0.28	0.48	MINING		-	-	-	INCOMPLETE PUSH
0.48	0.53	DELAY					EXPAND RING #2338
0.53	1.10	MINING		1.00	3-12,17-24	13000	COMPLETED PUSH
1.10	1.25	RING INSTALLATION	2340				
1.25	1.40	MINING		-	-	-	INCOMPLETE PUSH
1.40	2.10	DELAY					FIX HYDRLC.HOSE (NO.2 MOTOR RETURN)
2.10	2.40	MINING		1.00	3-12,17-24	13000	COMPLETED PUSH
2.40	2.50	DELAY					EXPAND RING #2339
2.50	3.00	RING INSTALLATION	2341				
3.00	3.25	MINING		-	-	-	INCOMPLETE PUSH
3.25	3.28	DELAY					EXPAND RING #2340
3.28	3.40	MINING		1.00	3-12,17-24	13000	COMPLETED PUSH
3.40	3.50	RING INSTALLATION	2342				
3.50	4.10	MINING		-	-	-	INCOMPLETE PUSH
4.10	4.40	LUNCH					
4.40	4.45	DELAY					EXPAND RING #2341
4.45	5.10	MINING		1.00	3-12,17-24	13000	COMPLETED PUSH
5.10	5.27	RING INSTALLATION	2343				
5.27	5.47	MINING		-	-	-	INCOMPLETE PUSH
5.47	5.50	DELAY					EXPAND RING #2342
5.50	6.10	MINING		1.00	3-12,17-24	13000	COMPLETED PUSH
6.10	6.24	RING INSTALLATION	2344				
6.24	6.42	MINING		-	-	-	INCOMPLETE PUSH
6.42	6.45	DELAY					EXPAND RING #2343
6.45	6.50	MINING		-	-	-	INCOMPLETE PUSH
6.50	7.05	DELAY					SECONDARY BELT SLIPPING
7.05	7.25	MINING		1.50	3-12,17-24	13000	COMPLETED PUSH
7.25	7.38	RING INSTALLATION	2345				
7.38	7.50	MINING		0.40	3-12,17-24	13000	INCOMPLETE PUSH
7.50	8.00	DELAY					POWER KICKED OFF
		-- SHIFT CHANGE------					
8.00	8.45	DELAY					POWER OFF ON T.B.M.

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 12,1984 File Name: DY12-12A
Chainage :Start 3484.46 m
End 3505.26 m Project No: 831-6014
Advance for day 20.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.45	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #8,30,37,39,42A,43B. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	12.45	DELAY					SECONDARY BELT LOCKED OUT
12.45	12.54	MINING		-	-	-	INCOMPLETE PUSH
12.54	13.04	DELAY					INSTALL SPACERS & EXPAND RING #2344
13.04	13.20	MINING		1.10	3-13,20-24	12000	COMPLETED PUSH
13.20	13.32	RING INSTALLATION	2346				
13.32	14.19	MINING		1.50	3-13,20-24	12000	-
14.19	14.26	RING INSTALLATION	2347				
14.26	14.31	DELAY					REPLACE "HOT" ROLLER ON SECONDARY BELT
14.31	14.55	MINING		-	-	-	INCOMPLETE PUSH
14.55	15.00	DELAY					INSTALL SPACERS & EXPAND RING #2345
15.00	15.15	MINING		1.50	12-24	15000	COMPLETED PUSH
15.15	15.25	RING INSTALLATION	2348				
15.25	16.00	DELAY					CHANGED CUTTER #36 (HOT)
		-- SHIFT CHANGE------					
16.00	16.30	DELAY					NO.4 BELT LINE STOPPED(SEQUENCE ROLLER)
16.30	16.34	MINING		-	-	-	INCOMPLETE PUSH
16.34	16.40	DELAY					NO.4 BELT LINE STOPPED
16.40	17.04	MINING		-	-	-	INCOMPLETE PUSH
17.04	17.11	DELAY					INSTALL SPACERS
17.11	17.28	MINING		1.50	13-24	12000	COMPLETED PUSH
17.28	17.42	RING INSTALLATION	2349				CHECK FOR GAS
17.42	18.11	MINING		-	-	-	INCOMPLETE PUSH
18.11	18.14	DELAY					INSTALL SPACERS
18.14	18.27	MINING		1.50	3,4,11-24	10500	COMPLETED PUSH
18.27	18.42	RING INSTALLATION	2350				
18.42	19.25	MAINTENANCE					REPLACE BLOCKS IN CUTTER #38, RE-TORQUE 5 CUTTERS, CHECK FOR GAS
19.25	19.49	MINING		-	-	-	INCOMPLETE PUSH
19.49	19.51	DELAY					INSTALL SPACERS
19.51	20.08	MINING		1.50	3-8,13-24	B-10000	COMPLETED PUSH
20.08	20.21	RING INSTALLATION	2351				
20.21	20.35	MINING		-	-	-	INCOMPLETE PUSH
20.35	21.05	LUNCH					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 12,1984 File Name: DY12-12A
Chainage :Start 3484.46 m
End 3505.26 m Project No: 831-6014
Advance for day 20.80 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.05	21.19	MINING		-	-	-	INCOMPLETE PUSH
21.19	21.21	DELAY					INSTALL SPACERS
21.21	21.30	MINING		1.50	3-8,13-24	9000	COMPLETED PUSH
21.30	21.43	RING INSTALLATION	2352				
21.43	21.47	DELAY					CHECK FOR GAS & CHECK CUTTERS
21.47	22.14	MINING		-	-	-	INCOMPLETE PUSH
22.14	22.16	DELAY					INSTALL SPACERS
22.16	22.28	MINING		1.50	3-8,13-24	9500	COMPLETED PUSH
22.28	22.41	RING INSTALLATION	2353				
22.41	23.04	MINING		-	-	-	INCOMPLETE PUSH
23.04	23.07	DELAY					INSTALL SPACERS
23.07	23.20	MINING		1.50	7,8,13-24	8500	COMPLETED PUSH
23.20	23.32	RING INSTALLATION	2354				
23.32	23.46	DELAY					RE-TORQUE 3 CUTTERS, CHECK FOR GAS
23.46	24.00	MINING		0.60	3-8,13-24	8500	INCOMPLETE PUSH
		-- SHIFT CHANGE--					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 13,1984
Chainage :Start 3505.26 m
End 3525.36 m
Advance for day 20.10 m

File Name: DY12-13A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.15	MINING		-	-	-	INCOMPLETE PUSH
0.15	0.30	DELAY					SECONDARY BELT SLIPPING
0.30	0.40	MINING		0.90	3,4,12-24	10000	COMPLETED PUSH
0.40	0.50	RING INSTALLATION	2355				
0.50	3.15	MAINTENANCE		-	-	-	CHANGED CUTTERS #11,42B,43B.
							ADJUST SECONDARY BELT TENSION
							ASSORTED MACHINE MAINTENANCE
3.15	3.38	MINING		-	-	-	INCOMPLETE PUSH
3.38	3.41	DELAY					EXPAND RING #2354
3.41	4.00	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
4.00	4.10	RING INSTALLATION	2356				
4.10	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.03	DELAY					EXPAND RING #2355
5.03	5.20	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
5.20	5.30	RING INSTALLATION	2357				
5.30	5.45	MINING		-	-	-	INCOMPLETE PUSH
5.45	5.48	DELAY					EXPAND RING #2356
5.48	6.05	MINING		-	-	-	INCOMPLETE PUSH
6.05	6.15	DELAY					NO POWER, FAN SWITCH ACCIDENTLY HIT
6.15	6.20	MINING		1.50	3-8,13-24	10000	COMPLETED PUSH
6.20	6.30	RING INSTALLATION	2358				
6.30	6.50	MINING		-	-	-	INCOMPLETE PUSH
6.50	6.53	DELAY					EXPAND RING #2357
6.53	7.05	MINING		1.50	3-8,12-24	10000	COMPLETED PUSH
7.05	7.15	RING INSTALLATION	2359				
7.15	7.20	MINING		-	-	-	INCOMPLETE PUSH
7.20	7.45	DELAY					POWER OFF, SECONDARY BELT TROUBLE
7.45	8.00	MINING		0.90	3-8,12-24	10000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
8.00	8.20	MINING		0.60	3,4,13-24	11000	COMPLETED PUSH
8.20	8.32	RING INSTALLATION	2360				
8.32	9.42	MAINTENANCE					RPLACE LOOSE CUTTER
9.42	10.29	MINING		1.50	3,4,13-24	11000	-
10.29	10.40	RING INSTALLATION	2361				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 13,1984 File Name: DY12-13A
Chainage :Start 3505.26 m
End 3525.36 m Project No: 831-6014
Advance for day 20.10 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
10.40	10.45	MAINTENANCE					CHECK & RE-TORQUE CUTTERS
10.45	10.52	DELAY					WORK ON SECONDARY BELT RELAY BOX
10.52	11.26	MINING		1.50	3,4,13-24	11000	-
11.26	11.34	RING INSTALLATION	2362				
11.34	11.39	DELAY					CHECK CUTTERS
11.39	12.10	MINING		-	-	-	INCOMPLETE PUSH
12.10	12.40	LUNCH					
12.40	14.10	MAINTENANCE		-	-	-	CHANGED CUTTERS #6,39,40,43A.
							ASSORTED MACHINE MAINTENANCE
14.10	14.20	DELAY					WORK ON SECONDARY BELT RELAY BOX
14.20	14.30	MINING		1.50	3,4,13-24	11000	COMPLETED PUSH
14.30	14.38	RING INSTALLATION	2363				
14.38	14.55	DELAY					BROKEN CABLE ON SECONDARY BELT
14.55	15.45	MINING		1.50	3,4,9-12,21-24	11000	-
15.45	15.52	RING INSTALLATION	2364				
15.52	16.00	MINING		0.40	3,4,9-12,21-24	11000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.27	MINING		-	-	-	INCOMPLETE PUSH
16.27	16.31	DELAY					INSTALL SPACERS
16.31	16.39	MINING		1.10	3,4,11,12, 21-24	12500	COMPLETED PUSH
16.39	16.53	RING INSTALLATION	2365				
16.53	17.19	MINING		-	-	-	INCOMPLETE PUSH
17.19	17.22	DELAY					INSTALL SPACERS
17.22	17.36	MINING		1.50	3,4,11,12, 21-24	9000	COMPLETED PUSH
17.36	17.50	RING INSTALLATION	2366				
17.50	19.05	DELAY					CHANGED CUTTERS #32,36. (HOT)
19.05	19.34	MINING		-	-	-	INCOMPLETE PUSH
19.34	19.35	DELAY					INSTALL SPACERS
19.35	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.10	DELAY					FIX BROKEN HYDRLC.FITTING (NO.10 CYL)
21.10	21.16	MINING		1.50	3,4,11-13,15, 21-24	9000	COMPLETED PUSH
21.16	21.30	RING INSTALLATION	2367				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

File Name: DY12-13A

Project No: 831-6014

Date DECEMBER 13,1984
Chainage :Start 3505.26 m
End 3525.36 m
Advance for day 20.10 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
21.30	22.38	MAINTENANCE & DELAY		-	-	-	REPAIR DUCT ON WEST SIDE(NEAR SURFACE)
							TIGHTEN SECONDARY CONVEYOR BOLTS
							INSTALL CONVEYOR STRUCTURE
							CHANGED CUTTER #39
22.38	23.09	MINING		-	-	-	INCOMPLETE PUSH
23.09	23.12	DELAY					INSTALL SPACERS
23.12	23.40	MINING		1.50	3-8,11,13-16, 21-24	9500	COMPLETED PUSH
23.40	24.00	?					REFER TO BOOK REPORT
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 14,1984 File Name: DY12-14A
Chainage :Start 3525.36 m
End 3537.36 m Project No: 831-6014
Advance for day 12.00 m

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.25	DELAY		-	-	-	BEARING TEMPERATURE LIGHT IN OUTSTATION IS SHOWING RED
0.25	0.33	MINING		0.30	3-16,21-24	6000	COMPLETED PUSH
0.33	0.43	RING INSTALLATION	2368				
0.43	1.00	DELAY					REPAIR HYDRLC. HOSE(NO.2 MOTOR)
1.00	1.15	MINING		-	-	-	INCOMPLETE PUSH
1.15	1.20	DELAY					INSTALL MESH & EXPAND RING #2367
1.20	2.00	MINING		1.50	3-16,21-24	8000	COMPLETED PUSH
2.00	2.10	RING INSTALLATION	2369				
2.10	2.30	MINING		-	-	-	INCOMPLETE PUSH
2.30	2.35	DELAY					INSTALL MESH & EXPAND RING #2368
2.35	3.00	MINING		1.50	3-16,21-24	8000	COMPLETED PUSH
3.00	3.10	RING INSTALLATION	2370				
3.10	3.30	MINING		-	-	-	INCOMPLETE PUSH
3.30	3.35	DELAY					INSTALL MESH & EXPAND RING #2369
3.35	4.00	MINING		-	-	-	INCOMPLETE PUSH
4.00	4.30	LUNCH					
4.30	4.45	MINING		1.50	3-16,21-24	8000	COMPLETED PUSH
4.45	4.58	RING INSTALLATION	2371				
4.58	5.30	MINING		-	-	-	INCOMPLETE PUSH
5.30	5.35	DELAY					INSTALL MESH & EXPAND RING #2370
5.35	6.00	MINING		-	-	-	INCOMPLETE PUSH
6.00	6.15	DELAY					T.B.M. CUTTING OUT (LOW PRESSURE)
6.15	6.23	MINING		1.50	3-16,21-24	8000	COMPLETED PUSH
6.23	6.35	RING INSTALLATION	2372				
6.35	6.55	DELAY					REPAIR HIGH PRESS HOSE(NO.2 BOOST PUMP)
6.55	7.25	MINING		-	-	-	INCOMPLETE PUSH
7.25	7.30	DELAY					INSTALL MESH & EXPAND RING #2371
7.30	8.00	MINING		1.50	3-16,21-24	8000	COMPLETED PUSH
		-- SHIFT CHANGE------					
8.00	8.15	RING INSTALLATION	2373				
8.15	8.25	MINING		-	-	-	INCOMPLETE PUSH
8.25	8.30	DELAY					POWER OFF AT T.B.M.
8.30	8.53	MINING		-	-	-	INCOMPLETE PUSH
8.53	8.58	DELAY					EXPAND RING #2371

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 14,1984
Chainage :Start 3525.36 m
End 3537.36 m
Advance for day 12.00 m

File Name: DY12-14A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
8.58	9.40	MINING		1.50	3,4,9-16,21-24	15000	COMPLETED PUSH
9.40	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #32,35,42A,43B.
12.00	12.30	LUNCH					
12.30	13.20	MAINTENANCE		-	-	-	END CUTTER CHANGE ASSORTED MACHINE MAINTENANCE
13.20	13.30	RING INSTALLATION	2374				
13.30	14.15	MINING		-	-	-	INCOMPLETE PUSH
14.15	14.17	DELAY					INSTALL SPACERS
14.17	14.55	MINING		1.50	3,4,9-16,21-24	15000	COMPLETED PUSH
14.55	15.05	RING INSTALLATION	2375				
15.05	15.28	MINING		1.20	3,4,9-16,21-24	15000	INCOMPLETE PUSH
15.28	15.50	DELAY					INSTALL SPACERS
15.50	16.00	DELAY					POWER OFF IN TUNNEL
		-- SHIFT CHANGE------					
16.00	24.00	DELAY		-	-	-	SHIFT CANCELLED DUE TO POWER TROUBLE ON THE MAIN LINE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 15,1984
Chainage :Start 3537.36 m
End 3545.03 m
Advance for day 7.67 m

File Name: DY12-15A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.25	-- SHIFT CHANGE------					RE-SET & START CONVEYORS
0.25	0.46	DELAY					SECONDARY BELT SLIPPING
0.46	0.58	MINING		0.30	3,4,9-24	12000	COMPLETED PUSH
0.58	1.08	RING INSTALLATION	2376				
1.08	1.35	MINING		-	-	-	INCOMPLETE PUSH
1.35	1.38	DELAY					EXPAND RING #2375
1.38	2.02	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
2.02	2.12	RING INSTALLATION	2377				
2.12	2.25	DELAY					REPAIR OIL LEAK(ELBOW ON NO.10 MOTOR)
2.25	2.47	MINING		-	-	-	INCOMPLETE PUSH
2.47	2.50	DELAY					EXPAND RING #2376
2.50	3.25	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
3.25	3.35	RING INSTALLATION	2378				
3.35	4.00	DELAY					MAIN CONVEYOR OFF(TRIPPED TRANSFORMER)
4.00	4.30	LUNCH					
4.30	4.40	DELAY					MAIN CONVEYOR OFF(TRIPPED TRANSFORMER)
4.40	5.00	MINING		-	-	-	INCOMPLETE PUSH
5.00	5.03	DELAY					EXPAND RING #2377
5.03	5.33	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
5.33	5.45	RING INSTALLATION	2379				
5.45	6.10	MINING		-	-	-	INCOMPLETE PUSH
6.10	6.13	DELAY					EXPAND RING #2378
6.13	6.43	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
6.43	6.53	RING INSTALLATION	2380				
6.53	7.20	MINING		-	-	-	INCOMPLETE PUSH
7.20	7.28	DELAY					EXPAND RING #2379 & INSTALL MESH
7.28	8.00	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
8.00	8.15	RING INSTALLATION	2381				
		-- SHIFT CHANGE------					END OF DAY'S WORK (WEEKEND)

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 17,1984
Chainage :Start 3545.03 m
End 3555.53 m
Advance for day 10.50 m

File Name: DY12-17A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	8.00	NO WORK CARRIED OUT					WEEKEND
8.00	8.25	-- SHIFT CHANGE------					RE-SET CONVEYORS
8.25	9.40	DELAY					WARM UP T.B.M.
9.40	10.20	MINING		-	-	-	INCOMPLETE PUSH
10.20	10.23	DELAY					EXPAND RING @2380
10.23	10.40	MINING		1.50	3-8,12-24	12000	COMPLETED PUSH
10.40	10.50	RING INSTALLATION	2382				
10.50	12.00	MAINTENANCE		-	-	-	RESET 2 CUTTERS & REWIRED CENTRE CUTTER; ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	14.15	MAINTENANCE		-	-	-	END CUTTER REPAIR
14.15	15.45	DELAY					S.F.G. SWITCH TROUBLE
15.45	16.00	MINING		0.50	3-8,12-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.40	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
16.40	16.50	RING INSTALLATION	2383				
16.50	17.55	MINING		1.50	3,4,9-24	13000	-
17.55	18.10	RING INSTALLATION	2384				
18.10	19.15	MINING		1.50	3,4,9-24	13000	-
19.15	19.25	RING INSTALLATION	2385				
19.25	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	21.00	MINING		-	-	-	INCOMPLETE PUSH
21.00	21.20	DELAY					NO.1 BELT SLIPPING
21.20	21.22	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
21.20	21.37	RING INSTALLATION	2386				
21.37	22.00	MINING		-	-	-	INCOMPLETE PUSH
22.00	22.06	DELAY					INSTALL MESH
22.06	22.40	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
22.40	22.51	RING INSTALLATION	2387				
22.51	23.16	MINING		-	-	-	INCOMPLETE PUSH
23.16	23.21	DELAY					INSTALL MESH
23.21	23.50	MINING		1.50	3,4,9-24	13000	COMPLETED PUSH
23.50	24.00	RING INSTALLATION	2388				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 18,1984
Chainage :Start 3555.53 m
End 3572.03 m
Advance for day 16.50 m

File Name: DY12-18A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
0.00	0.34	MINING		-	-	-	SHIFT CHANGE & INCOMPLETE PUSH
0.34	2.06	DELAY					STRUCTURE BAR FELL OUT(40 FT. OUT OF LINE OVER DIESEL GARAGE
2.06	2.26	MINING		-	-	-	INCOMPLETE PUSH
2.26	2.32	DELAY					SECONDARY BELT SLIPPING
2.32	2.38	MINING		-	-	-	INCOMPLETE PUSH
2.38	2.43	DELAY					SECONDARY BELT SLIPPING
2.43	2.47	MINING		1.50	3,4,11-20	13500	COMPLETED PUSH
2.47	3.02	RING INSTALLATION	2389				
3.02	3.37	MINING		-	-	-	INCOMPLETE PUSH
3.37	3.40	DELAY					INSTALL SPACERS
3.40	4.05	MINING		1.50	3,4,11-20	14500	COMPLETED PUSH
4.05	4.18	RING INSTALLATION	2390				
4.18	4.30	MINING		-	-	-	INCOMPLETE PUSH
4.30	5.00	LUNCH					
5.00	5.28	MINING		-	-	-	INCOMPLETE PUSH
5.28	5.31	DELAY					INSTALL SPACERS
5.31	5.58	MINING		1.50	3,4,8,11,12,14,16-24	14500	COMPLETED PUSH
5.58	6.13	RING INSTALLATION	2391				
6.13	6.27	MINING		0.30	3,4,9-24	12000	INCOMPLETE PUSH
6.27	8.00	MAINTENANCE		-	-	-	CHANGED CUTTER #16
		-- SHIFT CHANGE--					
8.00	12.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #10,18,30,42A,43B. ASSORTED MACHINE MAINTENANCE
12.00	12.30	LUNCH					
12.30	12.45	DELAY					START CONVEYORS
12.45	13.15	MINING		-	-	-	INCOMPLETE PUSH
13.15	13.18	DELAY					EXPAND RING #2390
13.18	13.40	MINING		1.20	3,4,9-24	10000	COMPLETED PUSH
13.40	13.53	RING INSTALLATION	2392				
13.53	14.03	DELAY					PRIME PUMP(NO WATER IN WATER SPRAYS)
14.03	14.30	MINING		-	-	-	INCOMPLETE PUSH
14.30	14.33	DELAY					EXPAND RING #2391
14.33	15.03	MINING		1.50	3,4,9-24	12000	COMPLETED PUSH
15.03	15.13	RING INSTALLATION	2393				

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 18,1984
Chainage :Start 3555.53 m
End 3572.03 m
Advance for day 16.50 m

File Name: DY12-18A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
15.13	15.43	MAINTENANCE		-	-	-	CHANGED CUTTER #30.
15.43	16.00	MINING		0.40	3,4,9-24	12000	INCOMPLETE PUSH
		-- SHIFT CHANGE------					
16.00	16.45	MINING		1.10	3,4,9-24	14000	COMPLETED PUSH
16.45	16.55	RING INSTALLATION	2394				
16.55	17.57	MINING		1.50	3,4,9-24	14000	-
17.57	18.07	RING INSTALLATION	2395				
18.07	19.10	MINING		1.50	3,4,9-24	14000	-
19.10	19.20	RING INSTALLATION	2396				
19.20	20.00	MINING		-	-	-	INCOMPLETE PUSH
20.00	20.30	LUNCH					
20.30	20.45	DELAY					HOOK UP WATER LINE
20.45	21.12	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
21.12	21.23	RING INSTALLATION	2397				
21.23	22.23	MINING		1.50	3,4,9-24	14000	-
22.23	22.33	RING INSTALLATION	2398				
22.33	22.48	MINING		-	-	-	INCOMPLETE PUSH
22.48	22.58	DELAY					SECONDARY BELT SLIPPING
22.58	23.48	MINING		1.50	3,4,9-24	14000	COMPLETED PUSH
23.48	24.00	RING INSTALLATION	2399				
		-- SHIFT CHANGE------					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 19,1984
Chainage :Start 3572.03 m
End 3579.78 m
Advance for day 7.75 m

File Name: DY12-19A

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Ring No.	Advance (m)	Push Cylinder In use	Push Cylinder Pressure (kPa)	Comments
		-- SHIFT CHANGE------					
0.00	0.34	MINING		-	-	-	INCOMPLETE PUSH
0.34	0.37	DELAY					INSTALL SPACERS
0.37	0.48	MINING		-	-	-	INCOMPLETE PUSH
0.48	1.05	DELAY					CUT PIECE OF SPLICE (PRIMARY BELT) & ADJUST BELT SCRAPERS
1.05	1.14	MINING		1.50	3,4,11-16, 20-24	15000	COMPLETED PUSH
1.14	1.30	RING INSTALLATION	2400				
1.30	4.00	MAINTENANCE		-	-	-	CHANGED CUTTERS #13,15,41,42A,43A,43B. ASSORTED MACHINE MAINTENANCE CHANGE PRIMARY CONVEYOR SPLICE
4.00	4.30	LUNCH					
4.30	6.25	MAINTENANCE		-	-	-	END CUTTER CHANGE
6.25	6.53	MINING		-	-	-	INCOMPLETE PUSH
6.53	6.55	DELAY					INSTALL SPACERS
6.55	7.04	MINING		-	-	-	INCOMPLETE PUSH
7.04	7.16	RING INSTALLATION	2401				
7.16	7.40	MINING		1.50	3,4,11-16, 20-24	14500	COMPLETED PUSH
7.40	8.00	DELAY		-	-	-	SET UP & START TO DRILL INSTRUMENTATION HOLE IN T.B.M. HEAD
		-- SHIFT CHANGE------					
8.00	11.25	DELAY		-	-	-	COMPLETE INSTRUMENTATION HOLE
11.25	11.50	MINING		-	-	-	INCOMPLETE PUSH
11.50	11.53	DELAY					EXPAND RING #2400
11.53	12.10	MINING		1.00	3,4,9-24	12000	COMPLETED PUSH
12.10	12.25	RING INSTALLATION	2402				
12.25	12.40	MINING		-	-	-	INCOMPLETE PUSH
12.40	13.10	LUNCH					
13.10	13.25	MINING		-	-	-	INCOMPLETE PUSH
13.25	13.28	DELAY					EXPAND RING #2401
13.28	13.50	MINING		1.00	3,4,9-24	12000	COMPLETED PUSH
13.50	14.00	RING INSTALLATION	2403				
14.00	14.10	DELAY					PRIME PUMP(WATER SPRAY SUPPLY)
14.10	14.40	MINING		-	-	-	INCOMPLETE PUSH

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 2)

Date DECEMBER 19,1984
Chainage :Start 3572.03 m
End 3579.78 m
Advance for day 7.75 m

File Name: DY12-19A

Project No: 831-6014

Time (hours)		Activity	Ring No.	Advance (m)	Push Cylinder		Comments
Start	End				In use	Pressure (kPa)	
14.40	14.43	DELAY					EXPAND RING #2402
14.43	15.00	MINING		1.00	3,4,9-24	13000	COMPLETED PUSH
15.00	15.10	RING INSTALLATION	2404				
15.10	16.00	DELAY					REPLACE SEVERED HYDRLC. HOSE
		-- SHIFT CHANGE------					
16.00	16.53	MINING		1.50	3,4,9-24	11000	-
16.53	17.00	RING INSTALLATION	2405				
17.00	17.25	DELAY					SECONDARY BELT DOWN(TRIPPED)
17.25	17.45	MINING		0.40	3,4,9-24	11000	INCOMPLETE PUSH
17.45	18.10	MINING		0.30			STEERING HEAD EXTENDED
							********** END OF TUNNEL **********
18.10	19.00	DELAY		-	-	-	DISMANTLE RING #2405
19.00	20.00	DELAY		-	-	-	DISMANTLE RING #2404
20.00	20.30	LUNCH					
20.30	23.40	DISASSEMBLY		-	-	-	REMOVE TAILSKIN BOLTS
							START TO DRILL OFR 3.5m BOLTS(WATER
							NEEDLE ON JACK LEG MISSING & WATER WAS
							FREZZING DRILL,TRY TO FIND REPLACEMENT.
23.40	24.00	-- SHIFT CHANGE------					

Notes:

APPENDIX A-2

TUNNEL NO. 3 - DAILY REPORTS

June 1985

831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 15,1982
Chainage :Start 152.08 m
End 152.08 m
Advance for day 0.00 m

File Name: T3-15-03-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
12.30	4.30	DRILLING FOR BLASTING	54	-	-	-	DRILLING FOR MANWAYS.
		CONSTRUCTION SERVICES	-	-	-	-	CLEAN ROADWAY IN PREPARATION FOR CONCRETE SURFACING.
3.00	3.25	LUNCH BREAK					
		------SHIFT CHANGE---					
5.40	7.00	DRILLING FOR BLASTING	22	-	-	-	DRILLING FOR MANWAY #6.
7.00	7.30	LUNCH BREAK					
8.45	9.40	LOADING					
9.40	10.05	DELAY	-	-	-	-	PLACING BLAST MATS AT MANWAY #3.
	10.10	BLAST-MANWAY					
10.10	10.15	SMOKE CLEARING TIME					
10.45	11.50	LOADING					
	12.15	BLAST-BENCH					
12.40	1.15	LOADING					
	1.25	BLAST-BENCH					

Notes: START AND END TIMES FOR THE SHIFTS ARE NOT CLEAR.
FIRST SHIFT WAS A DAY SHIFT, SECOND SHIFT PROBABLY WORKED PAST MIDNIGHT INTO THE 16th.

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 16,1982
Chainage :Start 152.08 m
End 152.08 m
Advance for day 0.00 m

File Name: T3-16-03-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
9.30	10.23	LOADING					
	10.27	BLAST AT STN. 0+096.4	25	85.40			
	10.27	BLAST AT STN. 0+114.6	23	77.28			
10.27	10.50	SMOKE CLEARING TIME					
10.50	12.00	CONSTRUCTION SERVICES	-	-	-	-	FLOOR SLASHED
12.00	16.00	DRILLING FOR BLASTING					
14.30	15.00	DELAY	-	-	-	-	REPAIR WATER PUMP
	12.30	BLAST	4	1 STICK 320 TOVEX			
	12.45	BLAST	4	"			
	13.15	BLAST	4	"			
	16.00	BLAST	4	"			
	16.13	BLAST	3	"			
	16.23	BLAST	3	"			
		CONSTRUCTION SERVICES	-	-	-	-	2 LENGTHS OF VENT TUBING REMOVED.
		----SHIFT CHANGE-----					
17.30	24.00	MUCKING					
MARCH	17,1982	----------					
0.00	2.30	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Bonkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 17,1982
Chainage :Start 152.08 m
End 154.40 m
Advance for day 2.32 m

File Name: T3-17-03-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
		BLAST OF SAFETY BAY AT STN. 0+132.9					
8.42	9.02	LOADING	18	60.48			
9.02	9.33	DELAY	-	-	-	-	HAD TO MOVE EQUIPMENT.
	9.33	BLAST					
9.33	9.49	SMOKE CLEARING TIME					
		CONSTRUCTION SERVICES	-	-	-	-	DRILLED HOLES TO HANG SERVICES INSTALLED 2 LENGTHS OF VENT TUBING
14.00	15.15	ROCK BOLT DRILLING					
16.00	17.13	ROCKBOLT INSTALLATION			10 x 2.5m		
		----SHIFT CHANGE-----					
17.40	17.50	ROCKBOLT INSTALLATION			2 x 2.5m		
20.30	20.40	ROCK BOLT TORQUING			6		
19.15	20.00	SURVEYING					
20.25	23.00	DRILLING FOR BLASTING					
23.35	24.00	LOADING					
MARCH 18,1982		----------					
0.00	1.10	LOADING	73	242.00			
1.10	1.20	DELAY	-	-	-	-	WAITING FOR CAP TESTER.
	1.30	BLAST					
	2.00	SMOKE CLEARING TIME					
2.00	2.30	MUCKING					
-	-	CONSTRUCTION SERVICES	-	-	-	-	REPLACED SURFACE FAN.
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 18,1982
Chainage :Start 154.40 m
End 157.40 m
Advance for day 3.00 m

File Name: T3-18-03-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
8.05	10.10	MUCKING					
10.25	11.25	ROCKBOLT DRILLING					
11.47	13.50	ROCKBOLT INSTALLATION	-	-	10 x 2.5m		
13.50	17.10	INSTRUMENTATION	-	-	-	-	ONE ARRAY OF EXTENSOMETERS
17.10	17.25	MUCKING					
	17.17	ROCKBOLT INSTALLATION	-	-	-	-	2 ROCK BOLTS WERE INST'D IN
		----SHIFT CHANGE-----					STN. 0+115.6 SAFETY BAY.
17.30	18.24	MUCKING					
19.20	22.05	DRILLING FOR BLASTING					
22.10	23.36	LOADING	81	272.67			
	23.42	BLAST					
23.42	23.54	SMOKE CLEARING TIME					
MARCH	19,1982	----------					
0.12	1.40	MUCKING					
2.20	2.45	ROCKBOLT DRILLING					
	-	SURVEYING	-	-	-	-	SURVEYORS TOOK 1/2 HR. TO MARK FACE
	-	DELAY	-	-	-	-	WATER AT FACE
	-	CONSTRUCTION SERVICES	-	-	-	-	INSTALL 2 VENT TUBES
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

File Name: T3-19-03-82

Date MARCH 19,1982
Chainage :Start 157.40 m
End 159.75 m
Advance for day 2.35 m

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
8.14	10.30	ROCKBOLT DRILL & INST			12 x 2.5m		PROBLEMS WITH RESIN NOT SETTING
10.35	12.40	MUCKING					
13.00	14.55	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
15.30	17.05	DRILLING FOR BLASTING					
17.25	19.15	LOADING	78	322.08			
	19.25	BLAST					
19.25	19.50	SMOKE CLEARING TIME					
20.05	21.45	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 22,1982
Chainage :Start 159.75 m
End 161.20 m
Advance for day 1.45 m

File Name: T3-22-03-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
8.30	16.30	MUCKING					
9.00	12.45	DRILLING FOR BLASTING	-	-	-	-	DRILLING ROUND FOR SUMP
9.25	9.40	ROCKBOLT DRILLING					
12.30	14.40	ROCKBOLT INSTALLATION			6 x 2.5m		
14.50	16.05	LOADING	48	?			
	16.45	BLAST					
		CONSTRUCTION SERVICES	-	-	-	-	WRAPPED VENT TUBING JOINTS
		----SHIFT CHANGE-----					HUNG VENT TUBING
20.00	20.43	ROCKBOLT DRILLING					
20.00	20.19	DELAY	-	-	-	-	MOVING PUMPS
22.00	22.45	MUCKING					
22.45	0.24	DELAY	-	-	-	-	UNDEFINED
11.55	0.51	ROCKBOLT INSTALLATION	-	-	3 x 2.5m	-	IMPACT NOT WORKING PROPERLY
MARCH	23,1982	----------					
0.24	1.45	MUCKING					
0.45	0.51	DELAY	-	-	-	-	TIGHTEN BOLTS
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 23,1982
Chainage :Start 159.75 m
End 162.75 m
Advance for day 3.00 m

File Name: T3-23-03-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
8.00	10.35	MUCKING	-	-	-	-	MUCKING WITH SCOOP AND BACKHOE
8.00	10.45	SCALING	-	-	-	-	CLEANING FACE
11.15	11.40	SCALING	-	-	-	-	SCALING FACE
11.40	11.55	SET UP TO DRILL					
11.55	15.20	DRILLING FOR BLASTING					
15.45	17.25	LOADING	?	?			
	17.45	BLAST					
17.45	18.00	SMOKE CLEARING TIME					
		----SHIFT CHANGE-----					
18.00	21.45	MUCKING					
21.56	23.00	ROCKBOLT DRILLING					
23.15	24.00	ROCKBOLT INSTALLATION					
MARCH	24,1982						
0.00	2.15	ROCKBOLT INSTALLATION			17 x 2.5 m		
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 24,1982
Chainage :Start 162.75 m
End 166.40 m
Advance for day 3.65 m

File Name: T3-24-03-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
8.30	10.20	MUCKING					
11.15	14.15	DRILLING FOR BLASTING					
14.15	17.30	LOADING	?	?			
	~17.45	BLAST					
~17.45	18.00	SMOKE CLEARING TIME					
		CONSTRUCTION SERVICES	-	-	-	-	EXTENDED WATER RETURN AND VENTILATION
		----SHIFT CHANGE-----					
18.00	18.20	INSPECTION	-	-	-	-	BLAST EXAMINATION
18.20	19.50	DELAY	-	-	-	-	BEAVER CREW IN A MEETING
19.50	0.11	MUCKING					
19.50	20.15	DELAY	-	-	-	-	REPAIRS TO 977
23.40	23.55	DELAY					MARKING ROCK BOLT HOLES.
MARCH	25,1982						
0.11	1.15	DELAY	-	-	-	-	NO BITS,OILING MACHINE.
1.15	1.55	ROCK BOLT DRILLING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 25,1982
Chainage :Start 166.40 m
End 169.65 m
Advance for day 3.25 m

File Name: T3-25-03-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
8.40	9.40	ROCK BOLT DRILLING					
10.50	11.10	ROCKBOLT INSTALLATION					
11.30	14.45	ROCKBOLT INSTALLATION AND SCALING			17 x 2.5 m		
14.45	16.00	CONSTRUCTION SERVICES	-	-	-	-	INST'D : 1 LENGTH AIR RETURN-42" :1 1/2 LENGTHS VENTILATION DRILL HOLES(BLAST PLATES & CONVERGENT POINTS)
		----SHIFT CHANGE-----					
16.30	20.00	MUCKING					
20.00	20.30	SURVEYING	-	-	-	-	MARK FACE
20.47	23.30	DRILLING FOR BLASTING					
23.30	0.53	LOADING	65	246.90			
	0.53	BLAST					
MARCH	26,1982						
0.53	1.07	SMOKE CLEARING TIME					
1.00	4.03	MUCKING					
4.03	4.30	DELAY	-	-	-	-	FIX SUMP PUMP
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 26,1982
Chainage :Start 169.65 m
End 172.80 m
Advance for day 3.15 m

File Name: T3-26-03-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
7.10	7.30	CONSTRUCTION SERVICES	-	-	-	-	WORKING AROUND FACE-MOVING PUMP.
7.3	7.40	DELAY	-	-	-	-	MARKING ROCK BOLT HOLES.
7.40	7.55	DELAY	-	-	-	-	SETTING UP JUMBO
7.55	8.30	ROCKBOLT DRILLING					
8.30	8.55	DELAY	-	-	-	-	WAITING FOR ROCK BOLTS
9.07	10.37	ROCKBOLT INSTALLATION			11 x 2.5 m		
10.40	11.20	MUCKING					
11.15	12.15	DELAY	-	-	-	-	MARKING ROCK BOLT HOLES.
12.25	15.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
15.30	17.58	LOADING	80	273.64			
16.39	16.55	DELAY	-	-	-	-	SCOOP NOT AVAILABLE.
	17.58	BLAST					
17.58	18.13	SMOKE CLEARING TIME					
18.15	21.10	MUCKING					
21.10	21.30	CONSTRUCTION SERVICES	-	-	-	-	INST'D PINS TO HANG PUMPS
		----SHIFT CHANGE-----					END OF WORK FOR SHIFT

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 29,1982
Chainage :Start 172.80 m
End 176.10 m
Advance for day 3.30 m

File Name: T3-29-03-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
9.00	9.55	ROCKBOLT DRILLING					
10.30	14.52	ROCKBOLT INSTALLATION			15 x 2.5m		INSTALLED AT STN. 0+172.8
10.30	10.49	DELAY	-	-	-	-	TROUBLE WITH HOSES
12.10	13.30	DELAY	-	-	-	-	TROUBLE TORQUING BOLTS
12.26	13.30	MUCKING					
14.20	16.25	MUCKING					
		----SHIFT CHANGE-----					
18.00	20.20	DRILLING FOR BLASTING					
21.30	23.29	LOADING	84	287.04			
MARCH	30,1982						
	0.11	BLAST					
0.11	0.21	SMOKE CLEARING TIME					
0.55	2.00	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 30,1982
Chainage :Start 176.10 m
End 179.86 m
Advance for day 3.76 m

File Name: T3-30-03-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
8.05	9.59	MUCKING					
9.30	9.36	DELAY	-	-	-	-	MARKED OUT ROCK BOLT LOCATION
9.59	10.26	DELAY	-	-	-	-	SERVICES TO BE HOOKED UP.
9.59	11.03	ROCKBOLT DRILLING					
11.03	12.45	ROCKBOLT INSTALLATION			10 x 2.5 m		
13.24	14.13	MUCKING					
14.50	17.11	DRILLING FOR BLASTING					
14.50	15.30	DELAY	-	-	-	-	ELECTRIC PUMP DOWN.
		----SHIFT CHANGE-----					
17.30	17.55	DRILLING FOR BLASTING					
18.00	19.20	LOADING	75	256.45			
	19.30	BLAST					
19.30	19.40	SMOKE CLEARING TIME					
19.55	22.10	MUCKING					
22.40	23.20	ROCKBOLT DRILLING					
23.50	1.04	ROCKBOLT INSTALLATION			5 x 3.0 m		
MARCH	31,1982	----------					
1.30	3.20	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date MARCH 31,1982
Chainage :Start 179.90 m
End 185.20 m
Advance for day 5.30 m

File Name: T3-31-03-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
8.00	8.45	DELAY	-	-	-	-	WATER TOO HIGH.
8.45	11.18	DRILLING FOR BLASTING					
10.45	11.00	DELAY	-	-	-	-	BACKHOE CLEANED TOE OF THE FACE.
11.18	12.40	LOADING	82	263.52			
	12.48	BLAST					
12.48	12.54	SMOKE CLEARING TIME					
13.20	15.00	MUCKING					
15.20	16.37	ROCK BOLT DRILLING					
16.37	17.16	ROCKBOLT INSTALLATION			6 x 3.5m		
		----SHIFT CHANGE-----					
17.30	18.10	MUCKING					
18.40	21.20	DRILLING FOR BLASTING					
21.30	23.25	LOADING	91	275.25			
	11.45	BLAST					
11.45	11.55	SMOKE CLEARING TIME					
APRIL	01,1982	----------					
0.05	2.00	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 01,1982 File Name: T3-01-04-82
Chainage :Start 185.20 m
End 188.30 m Project No: 831-6014
Advance for day 3.10 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
8.05	8.30	MUCKING					
8.30	9.05	DELAY	-	-	-	-	MARKING ROCK BOLT HOLES
9.05	10.05	ROCK BOLT DRILLING					
10.05	10.48	ROCK BOLT INST'N			7 x 3.5 m		STN. 0+185.25
11.19	12.25	MUCKING					
13.03	15.20	DRILLING FOR BLASTING					
15.25	16.40	LOADING	80	264.66			
	16.51	BLAST					
16.51	17.00	SMOKE CLEARING TIME					
		----SHIFT CHANGE-----					
17.30	19.15	MUCKING					
19.15	19.55	CONSTRUCTION SERVICES	-	-	-	-	REPLACED SUMP PUMP.
19.35	20.00	SCALING BACK					
20.00	20.05	DELAY	-	-	-	-	MARKING ROCK BOLT HOLES
20.25	20.40	ROCK BOLT DRILLING					
20.40	21.00	DELAY	-	-	-	-	WAITING FOR ROCK BOLTS.
21.00	22.20	ROCK BOLT INST'N			5 x 3.5 m		STN. 0+186.6 & 0+185.25
23.35	24.00	SURVEYING & MAPPING					
APRIL	02,1982	----------					
0.15	2.40	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Developaent Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 02,1982 — File Name: T3-02-04-82
Chainage :Start 188.30 m
End 194.60 m — Project No: 831-6014
Advance for day 6.30 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
8.05	10.45	LOADING	83	273.85			
8.05	8.53	DELAY	-	-	-	-	CLEANED TOE OF FACE.
	10.55	BLAST					
10.55	11.00	SMOKE CLEARING TIME					
11.30	13.25	MUCKING					
14.15	15.00	SCALING					
14.15	15.25	ROCK BOLT DRILLING					
15.25	16.50	ROCKBOLT INSTALLATION			9 x 3.5 m		
		----SHIFT CHANGE-----					
17.30	17.45	ROCKBOLT INSTALLATION	-	-	-	-	FIXING BOLT INST'D ON DAY SHIFT.
17.45	18.45	MUCKING					
18.45	19.25	DELAY	-	-	-	-	BRAKES ON 297E STUCK
18.45	19.15	SURVEYING					
19.20	19.40	DELAY	-	-	-	-	SETING UP JUMBO, CHECKING FACE FOR LOCATION OF BURN CUT.
19.40	22.30	DRILLING FOR BLASTING					
10.45	1.05	LOADING	93	222.44			
APRIL	03,1982	----------					
	1.20	BLAST					
1.20	1.50	SMOKE CLEARING TIME					
1.55	4.00	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 03,1982
Chainage :Start 194.60 m
End 197.80 m
Advance for day 3.20 m

File Name: T3-03-04-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
8.00	9.20	ROCK BOLT DRILLING					
9.20	10.42	ROCKBOLT INSTALLATION			9 x 3.5 m		
10.10	10.20	DELAY	-	-	-	-	WAITING FOR REPLACMENT ROCK BOLT
							CARRIED OUT SCALING DURING WAIT.
10.42	11.30	MUCKING					
12.08	14.13	DRILLING FOR BLASTING					
14.13	15.30	LOADING	69	222.44			
	15.37	BLAST					
15.37	15.50	SMOKE CLEARING TIME					
		CONSTRUCTION SERVICES	-	-	-	-	INSTALLED VENT TUBING SUPPORTS
							INSTALLED 2 LENGTHS 2" PIPE (TO SUMP)
		----SHIFT CHANGE-----					
16.00	19.00	MUCKING					
18.20	18.35	DELAY	-	-	-	-	MARKING ROCK BOLT HOLES.
18.35	18.50	DELAY					SCALING
19.20	19.45	ROCK BOLT DRILLING					
20.35	21.55	ROCKBOLT INSTALLATION			7 x 3.5 m		
20.10	23.10	MUCKING					
22.55	23.05	DELAY	-	-	-	-	MARKING CENTER POINT
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 04,1982
Chainage :Start 197.90 m
End ? m
Advance for day ONE ROUND m

File Name: T3-04-04-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting: No. of Bt.Hls	Blasting: Weight of Powder kg	Rock Support: No. of Rockbolts	Rock Support: Shotcrete	Comments
8.00	8.30	MUCKING					
8.30	10.40	DRILLING FOR BLASTING					
10.40	11.20	DELAY	-	-	-	-	UNDEFINED
10.40	12.35	LOADING	73	215.22			
	12.45	BLAST					
12.45	13.00	SMOKE CLEARING TIME					
	13.12	BLAST FOR SAFETY BAY	25	35.13			
13.40	15.20	MUCKING	-	-	-	-	MARKING ROCK BOLT HOLES,SCALING
15.20	16.35	DELAY	-	-	-	-	BACKHOE IN THE WAY
15.20	17.17	ROCKBOLT DRILLING					
		----SHIFT CHANGE-----					
17.45	18.10	ROCK BOLT DRILLING					
18.45	21.09	ROCKBOLT INSTALLATION			41 x 3.5 m		
20.30	21.03	DELAY	-	-	-	-	DOLLY BROKE - HAD TO USE SMALL DOLLY
		CONSTRUCTION SERVICES	-	-	-	-	DRILLED HOLES FOR HANGING PIPE
							USING ROCK BREAKER ON TIGHT SPOTS OF FLOOR
							BOLTING SAFETY BAY AND SUMP
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 13,1982
Chainage :Start 201.30 m
End 201.30 m
Advance for day 0.00 m

File Name: T3-13-04-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	16.00	NO WORK CARRIED OUT					
16.00	18.35	MUCKING					
18.35	18.46	DELAY	-	-	-	-	BACKHOE HAD TO BE PUSHED(WATER AT THE FACE)
18.46	19.22	MUCKING					
19.22	21.50	DRILLING FOR BLASTING					
21.50	22.35	DELAY	-	-	-	-	WATER OVER THE KNEE HOLES(TOO HIGH)
22.35	23.50	LOADING	47				APPROX. 3/4 OF FACE LOADED
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 14,1982
Chainage :Start 201.30 m
End 206.40 m
Advance for day 5.10 m

File Name: T3-14-04-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	1.08	LOADING	83	265.49			
	1.08	BLAST					
1.08	1.20	SMOKE CLEARING TIME					
1.20	1.30	MARK ROCK BOLT HOLES					
1.30	4.00	MUCKING					
4.00	4.20	DELAY	-	-	-	-	UNDEFINED
4.20	7.31	ROCKBOLT DRILL & INST			6 x 3.5m		
7.31	8.00	DELAY	-	-	-	-	THREE ROCK BOLTS TORQUED IN TRANSFORMER BAY
		----SHIFT CHANGE-----					
8.00	8.50	DELAY	-	-	-	-	UNDEFINED
8.50	9.45	MUCKING					
9.45	12.30	CONSTRUCTION SERVICES	-	-	-	-	CLEAN SUMP,MAINTAIN PUMPS,REMOVE AIR RETURN TUBING,INSTALL AIR SUPPLY TUBING,STRAP OTHERS,PLACE STONE AT END OF CONCRETE ROADWAY, MARK FACE,MAPPING AND CONVERGENCE MEASUREMENTS OBTAINED.
12.30	13.30	MUCKING					
13.30	16.00	CONSTRUCTION SERVICES	-	-	-	-	END ACTIVITIES AS ABOVE NOTED
		----SHIFT CHANGE-----					
16.00	16.30	DELAY	-	-	-	-	UNDEFINED
16.30	18.45	DRILLING FOR BLASTING					
18.45	19.15	DELAY	-	-	-	-	CENTRE BOOM FINISHING DUE TO SEVERED HOSE EARLIER.
18.45	20.40	LOADING	76	584.08			
	20.55	BLAST					
20.55	21.10	SMOKE CLEARING TIME					
21.10	21.20	DELAY	-	-	-	-	UNDEFINED
21.20	24.00	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date: APRIL 15,1982
Chainage: Start 206.40 m
End 209.40 m
Advance for day 3.00 m

File Name: T3-15-04-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	1.08	DRILLING					
1.08	2.05	ROCKBOLT DRILL & INST			7 x 3.5m		
2.05	2.30	DELAY	-	-	-	-	UNDEFINED
2.30	3.05	DELAY	-	-	-	-	NEW SIGHT STATION DESTROYED
3.05	3.30	MUCKING					
3.30	6.10	DRILLING FOR BLASTING					
6.10	6.15	DELAY	-	-	-	-	UNDEFINED
6.15	7.40	LOADING	76	?			
7.40	8.08	DELAY	-	-	-	-	UNDEFINED
	8.08	BLAST					
8.08	8.30	SMOKE CLEARING TIME					
		------SHIFT CHANGE---					
8.30	12.00	MUCKING					
12.00	12.30	LUNCH BREAK					
12.30	13.20	SCALING	-	-	-	-	CLAY SEAM IN BACK(ROOF)
13.20	13.40	DELAY	-	-	-	-	GOLDER INSPECTION OF SAME
13.40	13.50	DELAY	-	-	-	-	DBJ TRUCK DOWN(PUSH OUT WITH 977)
13.50	14.50	ROCKBOLT DRILL & INST			11 x 3.5m		
14.50	16.00	CONSTRUCTION SERVICES					EXTEND 2" WATER LINE
		------SHIFT CHANGE---					
16.15	18.07	ROCKBOLT DRILL & INST			7 x 3.5m		
18.07	20.10	MUCKING					
20.10	20.18	DELAY	-	-	-	-	BACKHOE HAD TO BE PUSHED
20.18	20.50	DELAY	-	-	-	-	EXTEND AIR AND WATER LINES
20.50	23.30	DRILLING FOR BLASTING					
23.30	24.00	LOADING	-	-	-	-	CLEAN HOLES PRIOR TO LOADING
		------SHIFT CHANGE---					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 16,1982
Chainage :Start 209.40 m
End 212.08 m
Advance for day 2.68 m

File Name: T3-16-04-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.05	1.20	LOADING	85				
1.20	1.35	DELAY	-	-	-	-	REPLACE BAD CAP
	1.45	BLAST					
1.45	2.05	SMOKE CLEARING TIME					
2.05	2.10	DELAY	-	-	-	-	UNDEFINED
2.10	3.00	MUCKING					
3.00	5.00	DELAY	-	-	-	-	DJB OUT OF FUEL(TOW OUT)
5.00	6.20	MUCKING					MARKING ROCK BOLT HOLES AT 5.55
6.20	7.15	ROCKBOLT DRILL & INST					
7.15	8.00	SCALING AND MUCKING					
		----SHIFT CHANGE-----					
8.30	10.10	ROCKBOLT DRILL & INST			12 x 2.5m		
10.10	10.25	DELAY	-	-	-	-	COFFEE BREAK
10.25	13.10	ROCKBOLT DRILL & INST					
13.10	16.00	MESH INSTALLATION	-	-	-	-	CHAINAGE 198m - 211m
		----SHIFT CHANGE-----					
	16.03	DELAY	-	-	-	-	FALL OF GROUND (MEN BROUGHT TO SURFACE)
16.27	17.10	ROCKBOLT INSTALLATION			2 x 2.5m		TRANSFORMER BAY AREA
17.10	24.00	CONSTRUCTION SERVICES					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date APRIL 17,1982 File Name: T3-17-04-82
Chainage :Start 212.08 m
End 212.08 m Project No: 831-6014
Advance for day 0.00 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	8.00	MESH INSTALLATION	-	-	-	-	LOOSE ROCK FRAGMENTS STILL PRESENT BEHIND THE INSTALLED MESH BECAUSE OF POOR SCALING. CHAINAGE 195m - 212.08m
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JUNE 28,1982
Chainage :Start 440.70 m
End 446.54 m
Advance for day 5.84 m

File Name: T3-28-06-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	0.15	----SHIFT CHANGE-----					
0.15	2.01	MUCKING					
1.30	6.30	DELAY	-	-	-	-	PUMP PROBLEMS - PUMP FOULED
3.00	5.00	CONSTRUCTION SERVICES	-	-	-	-	EXTENED WATER LINES
6.30	7.15	SURVEYING					
7.00	8.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
8.00	10.15	DRILLING FOR BLASTING					
10.15	11.15	LOADING	61	285.50			
	11.34	BLAST					
8.00	11.15	CONSTRUCTION SERVICES	-	-	-	-	INSTALLED 42" AIR WAY & BRACKETS
12.30	14.15	MUCKING					
14.20	14.45	MUCKING					
15.00	15.30	DELAY	-	-	-	-	SCALING BY C.B.D.C. PERSONNEL
							MARKING ROCK BOLT HOLES.
		----SHIFT CHANGE-----					
16.00	16.30	CONSTRUCTION SERVICES	-	-	-	-	SETTING UP ELECTRIC PUMP AT FACE
16.35	17.15	ROCK BOLT DRILLING					
17.40	19.30	ROCKBOLT INSTALLATION AND SCALING			10 x 3.5m		
19.40	20.00	SURVEYING					
20.00	20.10	MAPPING					
20.30	22.50	DRILLING FOR BLASTING					
20.55	0.05	LOADING	71	300.90			
	0.25	BLAST					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project

Rock Support Interaction Study

DAILY REPORT (Tunnel # 3)

Date JUNE 29,1982

Chainage :Start 446.54 m

End 450.05 m

Advance for day 3.51 m

File Name: T3-29-06-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
	0.25	BLAST					
0.25	0.30	SMOKE CLEARING TIME					
0.30	3.15	MUCKING					
0.53	1.05	DELAY	-	-	-	-	MARKING ROCK BOLT HOLES.
3.20	4.35	ROCK BOLT DRILLING					
5.00	5.27	ROCKBOLT INSTALLATION					
5.27	5.44	SCALING					
5.44	7.00	ROCKBOLT INSTALLATION			15 x 3.5m		
7.00	7.13	DELAY	-	-	-	-	MOVE SCISSOR LIFT
7.13	7.34	SURVEYING					
7.34	7.55	MUCKING					
		----SHIFT CHANGE-----					
8.00	10.30	DRILLING FOR BLASTING					
10.30	10.50	DELAY	-	-	-	-	MUCKED OUT LIFTERS
10.50	11.05	DRILLING FOR BLASTING					
11.10	12.00	LOADING	60	277.52			
	12.15	BLAST					
8.30	12.00	SURVEYING	-	-	-	-	NEW CONTROL STN. & ELEVATONS
12.45	14.45	MUCKING					
14.50	16.00	SHOTCRETING & SCALING					
8.00	12.00	CONSTRUCTION SERVICES	-	-	-	-	WORKING ON PIPE FOR SHOTCRETE.
12.45	16.00	CONSTRUCTION SERVICES					
		------SHIFT CHANGE---					
16.00	18.00	SHOTCRETING					
18.05	18.25	SCALING	-	-	-	-	MARKING ROCK BOLT HOLES.
18.35	19.10	ROCK BOLT DRILLING					
19.10	19.35	DRILLING	-	-	-	-	HOLES FOR PIPE
19.30	21.25	ROCKBOLT INSTALLATION			12 x 3.5m		
21.30	22.40	MUCKING					
22.40	23.12	SURVEYING	-	-	-	-	MARKING FACE
23.12	23.25	MAPPING					MAPPING FACE
23.25	24.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JUNE 30,1982
Chainage :Start 450.09 m
End 456.17 m
Advance for day 6.08 m

File Name: T3-30-06-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	1.30	DRILLING FOR BLASTING					
1.30	2.00	DRILL FOR PROBE HOLE					
1.30	2.00	CLEAN BLAST HOLES					
2.00	3.20	LOADING	77	267.20			
	3.38	BLAST					
3.38	4.00	SMOKE CLEARING TIME					
4.00	4.15	MARK ROCK BOLT HOLES AND SCALING					
4.10	6.10	MUCKING					
6.10	6.20	DELAY	-	-	-	-	UNDEFINED
6.20	8.00	ROCKBOLT DRILL & INST					
6.45	6.50	SCALING					
7.10	7.30	SCALING					
		----SHIFT CHANGE-----					
8.00	9.05	ROCKBOLT INSTALLATION			10 x 3.5m		
9.11	9.30	MUCKING					
9.30	10.15	DELAY	-	-	-	-	BACKHOE BLEW HOSE, BROUGHT IN "977"
10.15	10.50	MUCKING					
10.50	11.20	SURVEYING					
11.20	11.40	MUCKING					
11.45	13.30	DRILLING FOR BLASTING					
12.00	13.30	SURVEYING	-	-	-	-	OVERBREAK SECTIONS
13.35	14.30	LOADING	64	283.15			
	14.56	BLAST					
8.00	14.30	CONSTRUCTION SERVICES	-	-	-	-	INSTALLED 2 LENGTHS OF VENT TUBING AND SUPPORTS
15.00	16.00	MUCKING					
		----SHIFT CHANGE-----					
16.00	17.50	MUCKING					
18.00	18.30	SCALING					
18.45	20.45	SHOTCRETING					
21.05	21.40	ROCKBOLT DRILLING					
22.00	23.10	ROCKBOLT INSTALLATION			10 x 3.5m		
22.20	23.10	CONSTRUCTION SERVICES	-	-	-	-	HANGING PIPE
23.10	24.00	MUCKING					----SHIFT CHANGE-----

Notes:

Donkin-Morien Development Project

Rock Support Interaction Study

DAILY REPORT (Tunnel # 3)

Date JULY 01,1982

Chainage :Start 456.17 m

End 462.53 m

Advance for day 6.36 m

File Name: T3-01-07-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	1.37	SHOTCRETING					
0 30	1.30	CONSTRUCTION SERVICES	-	-	-	-	EXTENDING PIPE
1.37	2.06	SURVEYING	-	-	-	-	ALSO MARK FACE
2.06	3.50	DRILLING FOR BLASTING					
3.50	5.15	LOADING	75	250.65			
	5.31	BLAST					
5.31	5.40	SMOKE CLEARING TIME					
5.40	5.50	INSPECTION OF BLAST					
5.50	8.00	MUCKING	-	-	-	-	SLOW - ONE TRUCK BROKE DOWN IN
		----SHIFT CHANGE-----					THE MIDDLE OF THE INVERT
8.00	8.30	DELAY	-	-	-	-	NO EQUIPMENT TO RAISE INSPECTOR
							TO MARK HOLES
8.30	9.10	MARK ROCK BOLT HOLES AND SCALING					
9.15	9.40	ROCK BOLT DRILLING					
9.40	10.10	ROCK BOLT INST'N					
10.10	10.50	DELAY - SCALING					
10.50	11.43	ROCKBOLT INSTALLATION			10 x 3.5m		
11.43	12.05	DELAY - SCALING					
12.10	13.10	MUCKING					
13.10	14.45	DELAY	-	-	-	-	WATER AT THE FACE
14.45	16.00	MUCKING - SUMP					
15.15	16.00	SURVEYING	-	-	-	-	ALSO MARK FACE
		----SHIFT CHANGE-----					
16.00	17.30	MUCKING					
16.30	18.00	CONSTRUCTION SERVICES	-	-	-	-	HANGING TELEPHONE CABLE
17.30	17.50	DELAY	-	-	-	-	WAITING FOR LOADER
18.00	19.45	DRILLING FOR BLASTING					
19.40	19.53	DRILLING - PROBE HOLE					
19.45	21.05	LOADING FACE	67	258.16			ALSO SAFETY BAY
	21.30	BLAST					
21.45	22.10	LUNCH BREAK					
22.10	24.00	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JULY 02,1982
Chainage :Start 456.17 m
End 456.17 m
Advance for day 0.00 m

File Name: T3-02-07-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	0.45	MUCKING					
0.45	1.15	DELAY					
1.15	1.29	SCALING					
1.30	1.35	MARK ROCK BOLT HOLES					
1.35	3.40	ROCKBOLT DRILL & INST			10 x 3.5m		
3.30	3.40	MAPPING BACK & FACE					
3.40	5.05	CONSTRUCTION SERVICES	-	-	-	-	PREPARING FOR SHOTCRETING
5.05	8.00	DELAY	-	-	-	-	PLUGGED LINE
		----SHIFT CHANGE-----					END OF WORK FOR DAY

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JULY 05,1982 — File Name: T3-05-07-82
Chainage :Start 462.53 m
End 465.92 m — Project No: 831-6014
Advance for day 3.39 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	2.10	MUCKING					
2.10	2.40	MARK ROCK BOLT HOLES					
2.40	2.45	DELAY	-	-	-	-	UNDEFINED
2.45	4.40	DRILLING FOR BLASTING					
4.40	4.45	DELAY	-	-	-	-	UNDEFINED
4.45	6.45	LOADING	79	319.00			
	7.03	BLAST					
7.03	7.30	SMOKE CLEARING TIME					
7.30	8.00	MUCKING					
		----SHIFT CHANSE-----					
8.00	10.45	MUCKING					
10.45	11.05	MARK ROCK BOLT HOLES					
11.05	11.20	DELAY					UNDEFINED
11.20	11.30	CONSTRUCTION SERVICES	-	-	-	-	DRILL HOLES FOR PIPE
11.30	12.30	CONSTRUCTION SERVICES	-	-	-	-	HANG PIPE AND BRACES
11.35	12.10	ROCKBOLT DRILL & INST					
12.30	12.50	DELAY					UNDEFINED
12.50	13.30	ROCKBOLT DRILL & INST					
13.30	13.55	EXTENSOMETER READINGS					
13.55	14.00	ROCKBOLT DRILL & INST			10 x 3.5m		
14.00	14.40	MUCKING					
14.40	15.10	DELAY	-	-	-	-	SCISSOR LIFT DOWN
15.10	16.00	MUCKING					
14.15	15.30	CONSTRUCTION SERVICES	-	-	-	-	HANG PIPE
		----SHIFT CHANGE-----					
16.00	17.20	MUCKING					
17.13	17.41	MAPPING					
17.36	20.00	DRILLING FOR BLASTING					
18.30	19.30	CONSTRUCTION SERVICES	-	-	-	-	EXTEND BLASTING CABLE
20.00	21.40	LOADING	82	264.09			
	21.50	BLAST					
21.50	21.53	SMOKE CLEARING TIME					
21.53	22.05	BLAST INSPECTION					
22.05	22.25	SMOKE CLEARING TIME					(22.25-24.00MUCKING) ---SHIFT CHANGE---

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

File Name: T3-06-07-82

Project No: 831-6014

Date JULY 06,1982
Chainage :Start 468.72 m
End 472.07 m
Advance for day 3.35 m

Time (hours) Start	Time (hours) End	Activity	Blasting: No. of Bt.Hls	Blasting: Weight of Powder kg	Rock Support: No. of Rockbolts	Rock Support: Shotcrete	Comments
0.00	1.00	MUCKING	-	-	-	-	977 LOADER DOWN
1.00	1.30	DELAY					
1.30	2.20	MUCKING	-	-	-	-	UNDEFINED
2.20	2.30	DELAY					
2.30	5.07	ROCKBOLT DRILL & INST			10 x 3.5m		
5.07	5.10	DELAY	-	-	-	-	UNDEFINED
5.10	6.00	DELAY	-	-	-	-	ATTEMPT TO READ EXTENSOMETERS
6.00	7.15	MUCKING					
7.15	7.45	SURVEYING					
7.45	8.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
8.00	9.40	DRILLING FOR BLASTING					
8.30	11.00	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENTTUBING
9.50	10.20	DRILLING FOR BLASTING					ALSO DRILLED BUMP
10.00	11.20	LOADING	72	289.83			ALSO LOADED BUMP
	11.55	BLAST					
11.55	12.30	SMOKE CLEARING TIME					
12.30	14.25	MUCKING	-	-	-	-	THREE D.B.J.'S,ONE "977" AND ONE SCOOP USED.
14.35	14.50	SCALING AND MARK ROCK BOLT HOLES					
14.50	15.10	DELAY	-	-	-	-	UNDEFINED
15.10	15.30	ROCKBOLT DRILL & INST			6 x 3.5m		
15.30	15.45	DELAY	-	-	-	-	UNDEFINED
15.45	16.00	ROCKBOLT DRILL & INST	-	-	-	-	LOADED HOLES WITH RESIN AND SCALING
		----SHIFT CHANGE-----					
16.00	16.55	ROCKBOLT DRILL & INST					
16.55	17.00	DELAY	-	-	-	-	UNDEFINED
17.00	20.00	SURVEYING	-	-	-	-	SET GRADES FOR CEMENT PLANT
17.30	20.00	SHOTCRETING					
20.00	20.20	DELAY	-	-	-	-	UNDEFINED
20.20	21.35	MUCKING					
21.35	24.00	DELAY	-	-	-	-	UNDEFINED
21.45	24.00	DRILLING	-	-	-	-	DRILLING FOR SAFETY BAY
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JULY 07,1982
Chainage :Start 472.07 m
End 478.05 m
Advance for day 5.98 m

File Name: T3-07-07-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	2.30	MUCKING					
2.30	2.50	DELAY	-	-	-	-	BACKHOE STUCK
2.50	3.20	MARK ROCK BOLT HOLES					
2.50	3.45	MAPPING	-	-	-	-	MAP SIDEWALL
3.20	5.15	DRILLING FOR BLASTING					
5.15	6.20	LOADING	71	254.00			
	6.35	BLAST					
6.35	7.00	SMOKE CLEARING TIME					
7.00	8.00	MUCKING					
		----SHIFT CHANGE-----					
8.00	8.30	MUCKING					
8.30	9.30	DELAY	-	-	-	-	PROBLEMS WITH TWO "977'S"
9.30	11.05	MUCKING					
11.05	13.45	ROCKBOLT DRILL & INST			10 x 3.5m		
11.15	14.30	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING
13.45	14.00	DELAY	-	-	-	-	SCISSORLIFT IN WAY OF TUBE INSTALLATION
14.30	14.55	DELAY	-	-	-	-	UNDEFINED
14.55	15.30	SURVEYING					
15.30	16.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
16.00	17.20	DRILLING FOR BLASTING					
17.20	18.15	LOADING	77	242.48			
	18.34	BLAST					
18.15	19.05	SMOKE CLEARING TIME	-	-	-	-	EXIT TUNNEL AND LUNCH
		AND DELAY					
19.05	23.00	MUCKING					
23.00	23.13	SCALING					
23.13	23.20	MARK ROCK BOLT HOLES					
23.20	24.00	DRILLING FOR BLASTING	-	-	-	-	JUMBO MOVED IN FOR DRILLING
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JULY 08,1982
Chainage :Start 478.05 m
End 480.93 m
Advance for day 2.88 m

File Name: T3-08-07-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Dt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	1.15	ROCKBOLT DRILL & INST					
1.15	1.40	SCALING					
1.40	3.10	ROCKBOLT DRILL & INST			9 x 3.5m		
3.10	3.15	DELAY	-	-	-	-	UNDEFINED
3.15	8.00	SHOTCRETING					
		----SHIFT CHANGE-----					
8.00	9.00	MUCKING					
9.00	9.30	SURVEYING					
9.30	10.00	MUCKING					
10.00	10.55	DELAY	-	-	-	-	JUMBO DOWN
10.55	12.40	DRILLING FOR BLASTING					
11.00	12.50	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING
12.50	14.20	LOADING	77	304.80			
	14.35	BLAST					
14.35	14.45	SMOKE CLEARING TIME					
14.45	15.00	SCALING					
15.00	15.05	DELAY	-	-	-	-	UNDEFINED
15.05	16.00	MUCKING					
		----SHIFT CHANGE-----					
16.00	18.08	MUCKING					
18.08	18.22	SCALING					
18.22	18.36	MUCKING					
18.36	18.45	MARK ROCK BOLT HOLES					
18.45	18.59	DELAY	-	-	-	-	PLANNING
18.59	21.10	ROCKBOLT DRILL & INST			10 x 3.5m		
21.10	21.50	MUCKING					
21.50	22.20	SURVEYING AND MAPPING					
22.10	22.15	MUCKING					
22.15	24.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JULY 09,1982 — File Name: T3-09-07-82
Chainage :Start 480.93 m
End 484.91 m — Project No: 831-6014
Advance for day 3.98 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	0.20	DRILLING FOR BLASTING					
0.20	1.40	LOADING	65	504.27			
	2.00	BLAST					
2.00	2.30	SMOKE CLEARING TIME					
2.30	6.00	MUCKING	-	-	-	-	PROBLEMS WITH "977"
6.00	6.15	DELAY	-	-	-	-	UNDEFINED
6.15	8.00	ROCKBOLT DRILL & INST					
		----SHIFT CHANGE-----					
8.00	9.30	ROCKBOLT DRILL & INST			10 x 3.5m		
9.30	10.15	DELAY	-	-	-	-	UNDEFINED
10.15	10.40	DELAY	-	-	-	-	WATER PROBLEMS WITH SHOTCRETE
10.40	10.55	DELAY	-	-	-	-	UNDEFINED
10.55	13.15	SHOTCRETING					
13.15	13.30	DELAY	-	-	-	-	UNDEFINED
13.30	14.10	LUNCH BREAK					
14.10	14.15	DELAY	-	-	-	-	UNDEFINED
14.15	16.00	MUCKING					
		----SHIFT CHANGE-----					
16.00	16.30	MUCKING					
16.30	17.10	DRILLING FOR BLASTING					
17.10	17.35	LOADING	80	564.98			
	17.49	BLAST					
17.49	17.53	SMOKE CLEARING TIME					
17.53	18.14	MUCKING					
18.14	18.43	MARK ROCK BOLT HOLES					
18.43	18.50	DELAY					
18.50	21.15	DRILLING FOR BLASTING					
19.00	23.00	SURVEYING	-	-	-	-	SET LAZER
21.30	22.50	LOADING					
	23.13	BLAST					
23.12	23.35	SMOKE CLEARING TIME					
23.35	24.00	SCALING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JULY 10,1982
Chainage :Start 484.91 m
End 484.91 m
Advance for day 0.00 m

File Name: T3-10-07-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	1.30	SHOTCRETING					SET UP EQUIPMENT AND SCALING
1.30	3.45	SHOTCRETING					
3.45	4.00	MARK ROCK BOLT HOLES					
4.00	6.15	MUCKING					
6.15	8.30	ROCKBOLT DRILL & INST			5 x 3.5m		PROBLEMS WITH JUMBO
		----SHIFT CHANGE-----					
8.30	16.00	UNDEFINED	-	-	-	-	SHIFT ACT. DOCUMENTATION INCOMPLETE
		----SHIFT CHANGE-----					
16.00	23.05	CONSTRUCTION SERVICES	-	-	-	-	GRAVEL PLACEMENT
23.05	24.00	CONSTRUCTION SERVICES	-	-	-	-	CONCRETE PLACEMENT
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date JULY 11,1982
Chainage :Start 484.91 m
End 484.91 m
Advance for day 0.00 m

File Name: T3-11-07-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	24.00	CONSTRUCTION SERVICES ----SHIFT CHANGE-----	-	-	-	-	CONCRETE PLACEMENT FROM 422 m. TO 467 m

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date: NOVEMBER 08,1982
Chainage: Start 783.82 m
End 789.97 m
Advance for day 6.15 m

File Name: T3-08-11-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting: No. of Dt.Hls	Blasting: Weight of Powder kg	Rock Support: No. of Rockbolts	Rock Support: Shotcrete	Comments
0.00	0.15	----SHIFT CHANGE-----					
0.15	2.30	MUCKING					
2.30	2.55	MARK ROCK BOLT HOLES					
2.55	3.35	DELAY	-	-	-	-	UNDEFINED
3.35	5.40	DRILLING FOR BLASTING					
5.40	6.15	LOADING	68	229.39			
	6.40	BLAST					
6.40	7.00	LUNCH BREAK AND SMOKE CLEARING TIME					
7.00	7.15	DELAY	-	-	-	-	UNDEFINED
7.15	8.00	MUCKING					
		----SHIFT CHANGE-----					
8.00	12.00	MUCKING					
12.00	12.25	MARK ROCK BOLT HOLES					
12.25	13.05	ROCKBOLT DRILLING					
13.05	14.20	ROCKBOLT INSTALLATION			11 x 3.5m.		
12.45	14.45	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING
14.20	15.20	MUCKING					
15.20	15.35	SURVEYING					
15.35	16.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
16.00	19.13	DRILLING FOR BLASTING					
19.13	20.20	LOADING	77	211.58			
	20.42	BLAST					
20.42	21.10	SMOKE CLEARING TIME					
21.10	24.00	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date: NOVEMBER 09,1982
Chainage :Start 789.97 m
End 796.47 m
Advance for day 6.50 m

File Name: T3-09-11-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	0.40	MUCKING					
0.40	0.45	DELAY	-	-	-	-	UNDEFINED
0.45	1.52	ROCKBOLT DRILL & INST			10 x 3.5m		
1.52	2.13	HANGING MET					
2.13	2.40	MUCKING					
2.40	2.55	MARK ROCK BOLT HOLES					
2.55	3.10	MAPPING					
3.10	3.20	DELAY	-	-	-	-	UNDEFINED
3.20	5.35	DRILLING FOR BLASTING					
5.35	6.24	LOADING	74	148.59			
	7.00	BLAST					
7.00	7.20	SMOKE CLEARING TIME					
7.20	8.00	MUCKING					
		----SHIFT CHANGE-----					
8.00	10.07	MUCKING					
10.07	11.47	LOADING					
10.50	11.05	SURVEYING	-	-	-	-	PICK UP SERVICES
11.47	12.00	DELAY	-	-	-	-	UNDEFINED
12.00	13.30	MUCKING					
13.30	15.30	ROCKBOLT DRILL & INST			10 x 3.5m		
13.30	16.00	CONSTRUCTION SERVICES					INSTALL VENT TUBES & SUPPORTS
15.30	16.00	SCALING					
		----SHIFT CHANGE-----					
16.00	16.40	MUCKING					
16.40	16.55	MARK ROCK BOLT HOLES					
16.55	17.05	DELAY	-	-	-	-	UNDEFINED
17.05	19.35	DRILLING FOR BLASTING					
19.35	20.50	LOADING	94	242.49			
	21.40	BLAST					
21.40	22.15	SMOKE CLEARING TIME					
22.15	23.30	MUCKING					
	23.45	RE-BLAST					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date NOVEMBER 10,1982
Chainage :Start 796.47 m
End 800.03 m
Advance for day 3.56 m

File Name: T3-10-11-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Dt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	2.15	MUCKING					
2.15	2.20	DELAY	-	-	-	-	UNDEFINED
2.22	2.55	ROCKBOLT DRILL & INST			10 x 3.5m		
2.55	3.05	DELAY	-	-	-	-	UNDEFINED
3.05	5.00	ROCKBOLT DRILL & INST					
5.00	5.16	HANGING NETS					
5.16	5.25	DELAY	-	-	-	-	UNDEFINED
5.25	6.00	MUCKING					
6.05	6.25	MARK ROCK BOLT HOLES					
6.25	6.35	SURVEYING & MAPPING					
6.35	6.45	DELAY	-	-	-	-	UNDEFINED
6.45	8.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
8.00	10.45	DRILLING FOR BLASTING					
8.50	9.10	SURVEYING	-	-	-	-	SET LAZER
9.00	12.30	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT SUPPORT
11.00	12.15	LOADING	95	275.71			
12.15	12.30	REMOVE NETS					
	12.43	BLAST					
12.43	13.05	SMOKE CLEARING TIME					
13.05	15.00	MUCKING					
15.00	16.00	RE LOAD FACE					
		----SHIFT CHANGE-----					
16.00	17.40	PE LOAD FACE					
	18.19	RE BLAST					
18.19	18.55	SMOKE CLEARING TIME					
18.55	22.20	MUCKING					
22.20	23.10	LOADING					
	23.10	BLAST					
23.10	23.25	SMOKE CLEARING TIME					
23.25	24.00	MUCKING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel @ 3)

Date MOVEMBER 11,1982
Chainage :Start 800.03 m
End 800.03 m
Advance for day 0.00 m

File Name: T3-11-11-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	0.30	MUCKING					
0.30	0.40	DELAY	-	-	-	-	UNDEFINED
0.40	1.10	ROCKBOLT DRILL & INST					
1.15	1.30	CONSTRUCTION SERVICES					INSTALL PUMP
1.30	2.30	ROCKBOLT DRILL & INST			10 x 3.5m		
2.30	2.40	SCALING					
2.50	3.20	LUNCH BREAK					
3.20	4.10	SHOTCRETING					SET UP
4.20	5.05	SHOTCRETING					
5.05	5.40	DELAY	-	-	-	-	PLUGGED AND BROKEN LINE
5.40	6.05	SHOTCRETING					
6.05	6.20	DELAY	-	-	-	-	LINE PLUGGED
6.20	8.00	SHOTCRETING				794-798m	
		----SHIFT CHANGE-----				CROWN	
8.00	8.10	SHOTCRETING					
8.10	9.20	DELAY	-	-	-	-	PROBLEM WITH COMPRESSOR
9.20	9.40	SHOTCRETING					
9.40	11.00	DELAY	-	-	-	-	LINE PLUGGED
11.00	12.30	DELAY	-	-	-	-	TRUCK STUCK AT FACE
12.30	13.30	DELAY	-	-	-	-	WATER PROBLEMS
13.30	14.50	DELAY	-	-	-	-	LINE PLUGGED
14.50	14.55	SHOTCRETING					
14.55	15.30	DELAY	-	-	-	-	LINE PLUGGED
15.30	16.00	SHOTCRETING				790-794m	
		----SHIFT CHANGE-----				WEST HAUNCH	INSTALL BEAM BOLTS(8-12.00 & 13-16.00)
16.00	16.45	DELAY	-	-	-	-	CLEAN GOOSENECK
16.45	17.00	SHOTCRETING					
17.00	20.50	DELAY	-	-	-	-	LINE PLUGGED,PRESSURE PROBLEMS & LUNCH
20.50	21.00	SHOTCRETING					
21.00	21.20	DELAY	-	-	-	-	LINE PLUGGED
21.20	21.40	SHOTCRETING					
21.40	22.10	DELAY	-	-	-	-	LINE PLUGGED
22.10	22.15	SHOTCRETING					
22.15	22.50	DELAY	-	-	-	-	LINE PLUGGED
22.50	23.10	SHOTCRETING				789-794m	
23.10	24.00	DELAY	-	-	-	CROWN	LINE PLUGGED & SHIFT CHANGE

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date NOVEMBER 12,1982
Chainage :Start 800.03 m
End 800.03 m
Advance for day 0.00 m

File Name: T3-12-11-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	1.20	DELAY	-	-	-	-	STRIPPING SHOTCRETE PLANT & CLEARING LINES.
1.20	2.10	DELAY	-	-	-	-	GET HEADPHONES OPERATIONAL.
2.10	2.18	SHOTCRETING					
2.18	2.45	DELAY	-	-	-	-	LINES PLUGGED
2.45	3.20	SHOTCRETING					
3.20	4.25	DELAY	-	-	-	-	LINES PLUGGED
4.25	4.45	SHOTCRETING					
4.45	5.10	DELAY	-	-	-	-	LINES PLUGGED
5.10	5.35	SHOTCRETING					
5.35	6.10	DELAY	-	-	-	-	LINES PLUGGED
6.10	6.40	SHOTCRETING				785-789m	
6.40	8.00	DELAY	-	-	-	CROWN	WATER TOO COLD FOR SHOTCRETING WORK (WOULD NOT STAY UP)
		----SHIFT CHANGE-----					
8.00	16.00	CONSTRUCTION SERVICES	-	-	-	-	SET NEW SITE STATION
		----SHIFT CHANGE-----	-	-	-	-	END OF DAY'S WORK

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date NOVEMBER 15,1982 File Name: T3-15-11-82
Chainage :Start 800.03 m
End 800.03 m Project No: 831-6014
Advance for day 0.00 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	1.00	CONSTRUCTION SERVICES	-	-	-	-	PREPARE SHOTCRETE EQUIPMENT
1.00	1.40	SHOTCRETING				783-786m	
1.40	2.10	DELAY	-	-	-	CROWN	LINE BLOWN
2.10	2.20	SHOTCRETING					
2.20	2.45	DELAY	-	-	-	-	PLUGGED LINE
2.45	2.48	SHOTCRETING					
2.48	3.10	DELAY	-	-	-	-	PLUGGED LINE
3.10	3.17	SHOTCRETING				761-776m	
3.17	3.25	DELAY	-	-	-	CROWN	PLUGGED LINE
3.25	3.50	SHOTCRETING					
3.50	4.35	DELAY	-	-	-	-	CLEAN GOOSE NECK & LUNCH BREAK
4.35	4.50	DELAY	-	-	-	-	ENTER TUNNEL
4.50	7.32	SHOTCRETING				786-789m	AREAS OF DROP OUT WERE REDONE
7.32	8.00	DELAY	-	-	-	CROWN	UNDEFINED
		----SHIFT CHANGE-----					
8.00	8.15	PROBEHOLE SETUP					SET UP DRILL FOR PROBEHOLE
8.30	10.10	CONSTRUCTION SERVICES					INSTALL VENTTUBING AND PIPE
10.10	10.20	DELAY	-	-	-	-	START UP & REPOSITION DRILL ON D.B.J.
10.20	12.45	DRILL PROBEHOLE					
10.30	12.00	CONSTRUCTION SERVICES					INSTALL VENTTUBING AND PIPE
12.45	13.10	DELAY					
13.10	14.20	INSTRUMENTATION	-	-	-	-	INSTALL CONVERGENCE POINTS
13.20	14.10	CONSTRUCTION SERVICES					INSTALL VENTTUBING AND PIPE
14.10	14.45	DELAY	-	-	-	-	UNDEFINED
14.45	16.00	MUCKING	-	-	-	-	MUCK LIFTERS
		----SHIFT CHANGE-----					
16.00	16.20	MUCKING					
16.20	16.35	INSTRUMENTATION	-	-	-	-	SURVEY CONVERGENCE POINTS
16.35	17.15	MUCKING					
17.15	17.35	MARK ROCK BOLT HOLES					
17.35	20.00	DELAY	-	-	-	-	FLAT TIRE ON HYD. JUMBO & BENT BOOM ON AIR JUMBO.
20.00	23.25	DRILLING FOR BLASTING					
23.25	24.00	LOADING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date NOVEMBER 16,1982
Chainage :Start 800.03 m
End 806.20 m
Advance for day 6.17 m

File Name: T3-16-11-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	0.24	LOADING	88	317.00			
0.24	0.43	INSTRUMENTATION	-	-	-	-	INSTALL CONVERGENCE POINTS
0.43	1.07	DELAY	-	-	-	-	UNDEFINED
	1.09	BLAST					
1.09	1.32	SMOKE CLEARING TIME					
1.32	4.30	MUCKING					TWO "977'S" AND FOUR D.B.J.'S USED
4.30	6.30	ROCKBOLT DRILL & INST			10 x 3.5m		
6.30	7.15	MUCKING					
7.15	7.40	SURVEYING					
7.40	8.00	DELAY	-	-	-	-	JUMBO NOT AT FACE
		----SHIFT CHANGE-----					
8.15	10.50	DRILLING FOR BLASTING					
9.05	10.00	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING
10.15	10.40	MOVE ELECTRIC SKID					
10.55	11.35	LOADING	68	237.82			
10.50	12.30	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING
10.50	12.45	CONSTRUCTION SERVICES	-	-	-	-	HANG ELECTRICAL CABLE AND BRACES
	12.58	BLAST					
12.58	13.20	SMOKE CLEARING TIME					
13.20	15.15	MUCKING					FOUR D.B.J.'S USED
15.15	16.00	DELAY	-	-	-	-	D.B.J. STUCK
		----SHIFT CHANGE-----					
16.00	16.35	INSTRUMENTATION	-	-	-	-	READ CONVERGENCE POINTS
16.35	17.19	ROCKBOLT DRILLING					
17.19	18.45	ROCKBOLT INSTALLATION					
18.45	19.30	DELAY	-	-	-	-	IMPACT WRENCH BROKEN
19.30	19.50	ROCKBOLT INSTALLATION			17 x 3.5 m		
19.50	20.40	MUCKING	-	-	-	-	CLEAN FACE
20.40	21.05	SURVEYING	-	-	-	-	MARK FACE
21.05	24.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project

Rock Support Interaction Study

DAILY REPORT (Tunnel # 3)

Date NOVEMBER 17,1982 File Name: T3-17-11-82

Chainage :Start 806.20 m

End 812.10 m Project No: 831-6014

Advance for day 5.90 m

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	0.24	DRILLING FOR BLASTING					
0.15	1.08	LOADING	73	299.28			
1.08	1.11	TAKE DOWN NETS					
	1.26	BLAST					
1.26	1.50	SMOKE CLEARING TIME					
1.50	4.40	MUCKING	-	-	-	-	ONE "977" AND FOUR D.B.J.'S
4.40	5.10	LUNCH BREAK					
5.10	5.30	DELAY	-	-	-	-	UNDEFINED
5.30	7.05	ROCKBOLT DRILL & INST			11 x 3.5 m		
7.05	8.00	MUCKING	-	-	-	-	SCALING FACE AND MUCKING LIFTERS
		----SHIFT CHANGE-----					
8.00	9.05	MUCKING	-	-	-	-	CLEAN LIFTERS
8.40	9.25	CONSTRUCTION SERVICES	-	-	-	-	HANG 2" AND 4" PIPE
9.30	9.32	SURVEYING	-	-	-	-	MARK FACE
9.40	10.00	MAPPING					
9.40	10.15	INSTALL PUMP					
10.20	10.40	HANG NET					
10.40	11.10	DELAY	-	-	-	-	UNDEFINED
11.10	13.10	DRILLING FOR BLASTING					
13.05	13.25	LOADING					
13.25	13.45	DELAY	-	-	-	-	WAIT FOR SCISSOR LIFT
13.45	14.05	LOADING	66	216.04			
14.00	14.15	TAKE DOWN NETS					
14.15	15.10	DELAY	-	-	-	-	SCISSOR LIFT STUCK AT FACE
15.10	15.15	TAKE DOWN NETS					
	15.22	BLAST					
15.40	16.00	MUCKING	-	-	-	-	FOUR D.B.J.'S USED
		----SHIFT CHANGE-----					
16.00	20.30	MUCKING	-	-	-	-	FOUR D.B.J.'S USED MOST OF SHIFT
20.30	20.50	SCALING					
20.50	22.00	ROCKBOLT DRILLING					
22.00	22.30	HANG NETS					
22.30	23.00	SCALING					
23.00	24.00	ROCKBOLT INSTALLATION			10 x 3.5 m		----SHIFT CHANGE-----

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date NOVEMBER 18,1982
Chainage :Start 812.10 m
End 815.17 m
Advance for day 3.07 m

File Name: T3-18-11-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Dt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	1.10	ROCKBOLT DRILL & INST					
1.10	1.20	SURVEYING					
1.25	4.30	DRILLING FOR BLASTING					
4.30	5.10	LOADING	-	-			
5.10	5.37	TAKE DOWN NETS					
5.37	5.48	DELAY	-	-	-	-	UNDEFINED
	5.48	BLAST					
5.48	6.05	SMOKE CLEARING TIME					
6.05	8.00	MUCKING					
		----SHIFT CHANGE-----					
8.00	10.05	MUCKING	-	-	-	-	THREE D.B.J.'S USED
10.10	11.25	SCALING					
10.15	10.50	CONSTRUCTION SERVICES	-	-	-	-	DRILL LOOSE WITH JUMBO FOR PIPE BRACES
11.25	11.40	DELAY	-	-	-	-	UNDEFINED
11.40	12.25	ROCKBOLT DRILLING					
12.30	12.42	CONSTRUCTION SERVICES	-	-	-	-	DRILL HOLES IN WALL FOR ELECTRIC CABLE
12.55	14.30	ROCKBOLT INSTALLATION			15 x 3.5 m		
13.10	14.15	CONSTRUCTION SERVICES	-	-	-	-	HANG ELECTRICAL CABLES & SWITCH GEAR
14.25	14.40	CLEAN BOOTLEG					
14.40	15.15	DELAY	-	-	-	-	UNDEFINED
15.15	16.00	SHOTCRETING	-	-	-	-	SET UP EQUIPMENT
		----SHIFT CHANGE-----					
16.00	17.10	SHOTCRETING	-	-	-	-	CONTINUE SET UP OF EQUIPMENT
17.10	17.25	DELAY	-	-	-	-	HEADPHONE TROUBLE
17.25	18.30	SHOTCRETING					
18.30	19.20	DELAY	-	-	-	-	LINES PLUGGED
19.20	19.50	SHOTCRETING					
19.50	20.10	DELAY	-	-	-	-	LINES PLUGGED
20.10	20.15	SHOTCRETING					
20.15	20.35	DELAY	-	-	-	-	LINES PLUGGED
20.35	20.47	SHOTCRETING					
20.47	20.31	DELAY	-	-	-	-	LINE PLUGGED FIFTEEN FEET DOWN
20.31	23.25	SHOTCRETING				807-816m CROWN	
23.25	24.00	DELAY	-	-	-	-	LINE BROKEN(CHANGE WATER)-SHIFT CHANGE-

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date: NOVEMBER 19,1982
Chainage: Start 815.17 m
End 815.17 m
Advance for day 0.00 m

File Name: T3-19-11-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	0.45	DELAY	-	-	-	-	TAKE TRUCK TO FACE (REPLACE 1 PIPE)
0.45	2.05	SHOTCRETING					
2.05	2.10	DELAY	-	-	-	-	CLEAN GOOSENECK
2.10	2.50	SHOTCRETING					
2.50	3.15	DELAY	-	-	-	-	LINE PLUGGED
3.15	4.00	SHOTCRETING					
4.00	5.00	LUNCH BREAK					
5.00	6.00	SHOTCRETING				798-807a CROWN	
6.00	8.00	MUCKING	-	-	-	-	CLEAN INVERT
6.30	6.45	TEST PANELS					
		----SHIFT CHANGE-----					
8.00	9.05	CLEAN OUT MANWAY					
9.20	12.00	CONSTRUCTION SERVICES	-	-	-	-	HANG ELECTRICAL CABLE
10.00	10.45	MUCKING	-	-	-	-	CLEAN OUT FACE
10.50	12.45	CONSTRUCTION SERVICES	-	-	-	-	CLEAN INVERT AND PLACE GRAVEL
12.45	13.15	LUNCH BREAK					
13.00	15.40	CONSTRUCTION SERVICES	-	-	-	-	HANG ELECTRICAL CABLE
13.15	16.00	CONSTRUCTION SERVICES	-	-	-	-	CLEAN INVERT AND PLACE GRAVEL
		----SHIFT CHANGE-----					
16.00	17.20	CONSTRUCTION SERVICES	-	-	-	-	CLEAN INVERT AND PLACE GRAVEL
17.20	21.40	MUCKING					
21.40	22.25	SURVEYING	-	-	-	-	MARK FACE AND FLOOR GRADING
22.25	24.00	CONSTRUCTION SERVICES	-	-	-	-	CLEAN INVERT AND PLACE GRAVEL
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date NOVEMBER 20,1982 File Name: T3-20-11-82
Chainage :Start 815.17 m
End 815.17 m Project No: 831-6014
Advance for day 0.00 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Dt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	0.30	CONSTRUCTION SERVICES	-	-	-	-	CONCRETE POUR PREPARATION
0.30	2.30	CONSTRUCTION SERVICES	-	-	-	-	POUR INVERT
2.30	3.00	LUNCH BREAK					
3.00	8.00	CONSTRUCTION SERVICES	-	-	-	-	POUR INVERT
		----SHIFT CHANGE-----					
8.00	9.50	CONSTRUCTION SERVICES	-	-	-	-	POUR FLOOR
9.50	10.10	DELAY	-	-	-	-	UNDEFINED
10.10	10.40	CONSTRUCTION SERVICES	-	-	-	-	WIDENING PORTAL RAMP
10.40	10.55	DELAY	-	-	-	-	UNDEFINED
10.55	16.00	CONSTRUCTION SERVICES	-	-	-	-	POUR FLOOR IN STORAGE SHED
		----SHIFT CHANGE-----					END OF DAY'S WORK

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date DECEMBER 13,1982
Chainage :Start 892.48 m
End 895.28 m
Advance for day 2.80 m

File Name: T3-13-12-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	3.05	MUCKING					
3.05	3.30	SURVEYING	-	-	-	-	MARK FACE
3.30	4.25	MUCKING					
4.25	5.05	LUNCH BREAK					
5.05	6.00	DRILLING FOR BLASTING	-	-	-	-	SET UP EQUIPMENT
6.00	8.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					
8.00	11.15	DRILLING FOR BLASTING					
11.15	11.45	LOADING	72	261.88			
12.00	12.30	DELAY	-	-	-	-	CHECK WIRING
	12.40	BLAST					
12.40	13.00	SMOKE CLEARING TIME					
13.00	16.00	MUCKING					(8.00-16.00 CLEAR SITE OF SNOW)
		----SHIFT CHANGE-----					
16.00	16.45	MUCKING					
16.50	17.20	ROCKBOLT DRILL & INST					
17.20	17.45	DELAY	-	-	-	-	WAIT FOR SCISSOR LIFT
17.45	19.30	ROCKBOLT DRILL & INST			10 x 3.5 m		
19.30	19.35	HANG NETS					
19.35	20.30	MUCKING					
20.20	20.53	SURVEYING	-	-	-	-	MARK FACE
20.53	21.00	MAPPING					
20.55	21.10	MUCKING	-	-	-	-	PUTTING IN FILL AT FACE
21.15	23.50	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date DECEMBER 14,1982
Chainage :Start 895.28 m
End 901.98 m
Advance for day 6.70 m

File Name: T3-14-12-82

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting: No. of Dt.Hls	Blasting: Weight of Powder kg	Rock Support: No. of Rockbolts	Rock Support: Shotcrete	Comments
0.00	0.55	LOADING	71	236.52			
	1.15	BLAST					
1.15	1.35	SMOKE CLEARING TIME					
1.35	5.50	MUCKING	-	-	-	-	THREE D.B.J.'S USED
5.50	6.13	HANG NETS					
6.13	8.00	ROCKBOLT DRILL & INST AND SCALING					
		----SHIFT CHANGE-----					
8.00	9.15	ROCKBOLT DRILL & INST			12 x 3.5 m		
9.15	10.00	DELAY	-	-	-	-	UNDEFINED
10.00	10.15	SURVEYING					
10.00	14.20	CONSTRUCTION SERVICES	-	-	-	-	HANG TUBING
10.15	13.35	DRILLING FOR BLASTING					
13.35	14.20	LOADING	76	253.19			
	14.40	BLAST					
14.45	15.15	LUNCH BREAK AND SMOKE CLEARING TIME					
15.15	16.00	MUCKING					
		----SHIFT CHANGE-----					
16.00	18.20	MUCKING					
18.30	19.00	ROCKBOLT DRILLING					
19.00	20.25	ROCKBOLT INSTALLATION			10 x 3.5 m		
20.25	20.40	HANG NETS					
20.45	21.00	SURVEYING	-	-	-	-	MARK FACE
21.00	21.05	MAPPING FACE					
21.00	21.30	LUNCH BREAK					
21.05	21.25	MUCKING		-	-	-	CLEANING FACE
21.30	22.10	DRILLING FOR BLASTING	-	-	-	-	TAKE JUMBO DOWN AND SET UP
22.10	24.00	DRILLING FOR BLASTING	-	-	-	-	PROBLEM WITH AIRLINE(DRILL ROUND WITH ONE BOOM)
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel 8 3)

Date DECEMBER 15,1982 File Name: T3-15-12-82
Chainage :Start 901.98 m
End 900.86 m Project No: 831-6014
Advance for day 4.88 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	2.45	DRILLING FOR BLASTING					
2.45	2.55	DELAY	-	-	-	-	BUSTED HYDRAULIC LINE
2.55	3.25	DRILLING FOR BLASTING					
3.25	4.10	LOADING	?	?			
4.10	4.35	LUNCH BREAK					
	4.35	BLAST					
4.35	5.15	SMOKE CLEARING TIME					
5.15	8.00	MUCKING	-	-	-	-	FOUR D.B.J.'S USED
		----SHIFT CHANGE-----					
8.00	8.50	MUCKING					
8.50	9.20	ROCKBOLT DRILL & INST					
9.20	9.50	MUCKING					
9.20	9.30	ROCKBOLT DRILL & INST	-	-	-	-	MOVE JUMBO OUT
9.50	10.10	HANG NETS					
10.10	11.45	ROCKBOLT DRILL & INST			10 x 3.5 m		
11.45	11.50	DELAY	-	-	-	-	CLEAN MUCK LIFTERS
11.50	12.13	SURVEYING	-	-	-	-	MARK AND MAP FACE
12.00	16.00	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING AND SUPPORTS
12.13	16.00	DRILLING FOR BLASTING					
13.00	16.00	SURVEYING	-	-	-	-	CONVERGENCE POINTS
		----SHIFT CHANGE-----					
16.00	16.10	DRILLING FOR BLASTING					
16.20	17.00	LOADING	69	240.32			
	17.25	BLAST					
17.25	17.55	LUNCH BREAK AND SMOKE CLEARING TIME					
17.55	20.45	MUCKING	-	-	-	-	FOUR D.B.J.'S USED
20.50	21.35	ROCKBOLT DRILLING					
21.35	23.20	ROCKBOLT INSTALLATION					
23.20	23.50	DELAY	-	-	-	-	WAIT FOR TORQUE WRENCH
23.50	24.00	ROCKBOLT INSTALLATION			14 x 3.5 m		
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date DECEMBER 16,1982
Chainage :Start 908.86 m
End 915.17 m
Advance for day 6.31 m

File Name: T3-16-12-82

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	0.35	HANG NETS					
0.35	0.40	SURVEYING	-	-	-	-	CHAIN
0.40	0.55	MUCKING					
0.55	1.20	SURVEYING					
1.20	1.40	MUCKING					
1.40	4.20	DRILLING FOR BLASTING					
4.20	5.10	LOADING	71	237.60			
5.10	5.45	DELAY	-	-	-	-	CIRCUIT NOT TESTING
	6.02	BLAST					
6.02	6.20	SMOKE CLEARING TIME					
	6.20	CHECK BLAST					
6.20	8.00	MUCKING	-	-	-	-	FOUR D.B.J.'S USED
		----SHIFT CHANGE-----					
8.00	9.45	MUCKING					
9.45	11.09	SURVEYING					
9.45	10.05	HANG NETS					
10.00	11.45	CONSTRUCTION SERVICES	-	-	-	-	INSTALL PIPING(2",3",4",6".)
10.05	11.45	ROCKBOLT DRILL & INST			10 x 3.5 m		
11.45	12.15	LUNCH BREAK					
12.15	12.45	MUCKING	-	-	-	-	MUCK LIFTERS
12.45	13.03	SURVEYING	-	-	-	-	MARK FACE
13.05	16.00	CONSTRUCTION SERVICES	-	-	-	-	INSTALL PIPING(2",3",4",6".)
		----SHIFT CHANGE-----					
16.10	16.55	LOADING	63	236.42			
16.55	17.00	TAKE DOWN NETS					
	17.20	BLAST					
17.20	17.55	SMOKE CLEARING TIME					
17.55	20.15	MUCKING	-	-	-	-	THREE D.B.J.'S USED
20.15	20.30	DELAY	-	-	-	-	WAIT FOR FUEL FOR JUMBO
20.30	21.25	ROCKBOLT DRILLING					
21.25	23.25	ROCKBOLT INSTALLATION			11 x 3.5 m		
23.25	23.45	HANG NETS					
23.45	24.00	DELAY	-	-	-	-	WAIT FOR "930"
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date DECEMBER 17,1982 File Name: T3-17-12-82
Chainage :Start 915.17 m
End 918.00 m (APPROX.) Project No: 831-6014
Advance for day 2.83 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	0.35	MUCKING					
0.35	1.00	SURVEYING					
1.00	4.10	DRILLING FOR BLASTING					
4.10	4.50	LOADING	?	?			
	5.15	BLAST					
4.50	5.40	LUNCH BREAK AND					
		SMOKE CLEARING TIME					
5.40	8.00	MUCKING	-	-	-	-	THREE D.B.J.'S USED
		----SHIFT CHANGE-----					
8.00	10.00	MUCKING					
10.00	10.06	DELAY	-	-	-	-	DRILL OFF BOLTS
10.06	10.30	ROCKBOLT DRILL & INST					
10.40	11.05	HANG NETS					
11.05	12.30	ROCKBOLT DRILL & INST			10 x 3.5 m		
12.30	13.00	TAKE DOWN NETS					
13.00	16.00	SHOTCRETING	-	-	-	-	PUMP WATER FROM FACE & SET UP EQUIPMENT
		----SHIFT CHANGE-----					
16.00	17.00	SCALING					
17.10	17.36	SHOTCRETING				910-916m CROWN	
17.36	19.10	DELAY	-	-	-		LINE PLUGGED
19.10	19.20	SHOTCRETING					
19.20	20.05	DELAY	-	-	-	-	LINE PLUGGED
20.05	23.30	SHOTCRETING				916-918m CROWN	
23.30	24.00	DELAY	-	-	-	-	SHUT DOWN
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date DECEMBER 18,1982
Chainage :Start 918.00 m (APPROX.)
End 918.00 m (APPROX.)
Advance for day 0.00 m

File Name: T3-18-12-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.10	0.30	SHOTCRETING					
0.30	0.50	DELAY	-	-	-	-	PLUGGED LINE
0.50	1.23	SHOTCRETING					
1.23	2.20	DELAY	-	-	-	-	PLUGGED LINE NEAR SUMP
2.20	2.45	SHOTCRETING					
2.45	3.35	DELAY	-	-	-	-	PLUGGED LINE
3.35	4.00	SHOTCRETING					
4.00	4.55	DELAY	-	-	-	-	PLUGGED LINE 1/2 WAY DOWN
4.55	5.03	SHOTCRETING					
5.03	5.48	DELAY	-	-	-	-	PLUGGED LINE
5.48	6.15	SHOTCRETING					
6.15	6.35	DELAY	-	-	-	-	BUSTED PIPE (2ND. LAST PIPE)
6.35	7.10	SHOTCRETING				903-909m CROWN	
		----SHIFT CHANGE----					SHUT DOWN

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date DECEMBER 20,1982 File Name: T3-20-12-82
Chainage :Start 918.00 m (APPROX.)
End 918.00 m (APPROX.) Project No: 831-6014
Advance for day 0.00 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	8.00	SEE COMMENTS					SHIFT ACT. DOCUMENTATION INCOMPLETE
8.00	9.12	DELAY	-	-	-	-	SET UP EQUIPMENT
9.12	12.00	CONSTRUCTION SERVICES	-	-	-	-	HANG 6" LINE
11.30	15.00	SET UP DIAMOND DRILL					
12.00	12.30	LUNCH BREAK					
12.30	16.00	CONSTRUCTION SERVICES	-	-	-	-	CLEAN BOTTOM FOR ELECTRIC PUMP
		----SHIFT CHANGE-----					END OF DAY'S WORK

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date DECEMBER 21,1982
Chainage :Start 918.00 m (APPROX.)
End 918.00 m (APPROX.)
Advance for day 0.00 m

File Name: T3-21-12-82

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	8.00	SEE COMMENTS					SHIFT ACT. DOCUMENTATION INCOMPLETE
8.00	9.15	MUCKING	-	-	-	-	SET UP EQUIPMENT FOR MUCKING
8.00	10.00	SET UP DIAMOND DRILL					
9.15	12.20	MUCKING					
12.20	13.00	CONVERG. POINT SETUP					
13.00	13.20	DRILL CABLE HOLES					
13.20	16.00	INSTRUMENTATION	-	-	-	-	DRILL AND INSTALL CONVERGENCE POINTS
		----SHIFT CHANGE-----					END OF DAY'S WORK

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date FEBRUARY 07,1983
Chainage :Start 1009.90 m
End 1013.19 m
Advance for day 3.29 m

File Name: T3-07-02-83

Project No: 831-6014

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	8.00	SEE COMMENTS					SHIFT ACT. DOCUMENTATION INCOMPLETE
8.00	9.05	MUCKING					
9.05	9.20	SURVEYING	-	-	-	-	MARK FACE
9.20	9.30	SCALING					
9.20	9.50	CONSTRUCTION SERVICES	-	-	-	-	PLACE CONCRETE BARRIER IN FRONT OF TRANSFORMER BAY.
9.55	12.30	DRILLING FOR BLASTING					
10.00	11.30	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT BEAMS
12.30	13.20	CORE SHOTCRETE					
12.30	13.10	LOADING	66	252.71			
12.45	13.30	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING
	13.40	BLAST					
13.40	14.15	LUNCH BREAK AND SMOKE CLEARING TIME					
14.20	16.00	MUCKING	-	-	-	-	THREE D.B.J.'S USED
		----SHIFT CHANGE-----					
16.00	18.05	MUCKING					
18.05	20.54	ROCKBOLT DRILL & INST			17 x 3.5 m		
20.55	21.00	HANG 2 NETS					
21.05	21.30	SURVEYING					
	21.30	MUCKING	-	-	-	-	MUCK LIFTERS
21.55	24.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project

Rock Support Interaction Study

DAILY REPORT (Tunnel # 3)

Date FEBRUARY 08,1983

Chainage :Start 1013.19 m

End 1020.63 m

Advance for day 7.44 m

File Name: T3-08-02-83

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.00	0.20	DRILLING FOR BLASTING					
0.20	1.30	LOADING	68	268.14			
	2.00	BLAST					
2.00	2.30	SMOKE CLEARING TIME					
2.30	6.45	MUCKING	-	-	-	-	THREE D.B.J.'S USED
6.45	7.35	HANG 3 NETS AND SCALING					
7.35	8.00	ROCKBOLT DRILL & INST					
		----SHIFT CHANGE-----					
8.00	10.05	ROCKBOLT DRILL & INST			12 x 3.5 m		
9.20	10.05	CONSTRUCTION SERVICES	-	-	-	-	INSTALL VENT TUBING
10.15	10.45	INSTRUMENTATION					INSTALL CONVERGENCE POINTS
10.15	11.00	MUCKING	-	-	-	-	CLEAN FACE
10.30	12.30	SCALING					
11.00	11.15	SURVEYING	-	-	-	-	MARKED FACE
11.30	14.00	DRILLING FOR BLASTING					
11.35	12.00	CORE SHOTCRETE					
14.00	14.45	LOADING	66	283.31			
	15.20	BLAST					
15.20	15.30	SMOKE CLEARING TIME			"		
15.30	16.00	MUCKING					
		----SHIFT CHANGE-----					
16.00	19.30	MUCKING	-	-	-	-	THREE D.B.J.'S USED
19.30	20.10	ROCKBOLT DRILLING					
20.10	20.39	SCALING					
20.39	22.45	ROCKBOLT INSTALLATION			14 x 3.5 m		
22.45	23.05	MUCKING	-	-	-	-	MUCK LIFTERS
23.05	23.25	SURVEYING	-	-	-	-	MARK AND MAP FACE
23.30	24.00	DRILLING FOR BLASTING					
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date FEBRUARY 09,1983 File Name: T3-09-02-83
Chainage :Start 1020.63 m
End 1023.00 m (APPROX.) Project No: 831-6014
Advance for day 2.37 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	3.32	DRILLING FOR BLASTING					
3.32	4.30	LOADING	?	?			
4.30	5.13	TAKE DOWN NETS	-	-	-	-	ROUND NOT TESTED EXIT TUNNEL
	5.13	BLAST					
5.13	5.50	LUNCH BREAK					
	5.50	CHECK BLAST					
5.50	8.00	MUCKING	-	-	-	-	THREE D.B.J.'S USED
		----SHIFT CHANGE-----					
8.00	10.50	MUCKING					
10.50	11.05	HANG NETS					
11.05	11.20	DRILLHOLES FOR BRACES					
11.20	12.10	ROCKBOLT DRILLING					
12.10	14.15	ROCKBOLT INSTALLATION			24 x 3.5 m		
14.15	14.50	SCALING					
14.50	16.00	SHOTCRETING	-	-	-	-	SET UP EQUIPMENT
		----SHIFT CHANGE-----					
16.00	18.30	SHOTCRETING	-	-	-	-	END EQUIPMENT SET UP
18.30	18.45	DELAY	-	-	-	-	LINE PLUGGED
18.45	19.45	SHOTCRETING				1012-1023m CROWN	
19.45	20.15	DELAY	-	-	-	-	LINE PLUGGED
20.15	20.31	FILL SHOTCRETE TRUCKS					
20.50	22.00	SHOTCRETING					
22.00	22.20	LUNCH BREAK					
22.20	22.50	FILL SHOTCRETE TRUCKS					
23.00	24.00	SHOTCRETING				1000-1011m CROWN	
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date FEBRUARY 10,1983
Chainage :Start 1023.00 m (APPROX.)
End 1023.00 m (APPROX.)
Advance for day 0.00 m

File Name: T3-10-02-83

Project No: 831-6014

Time (hours) Start	End	Activity	Blasting No. of Bt.Hls	Blasting Weight of Powder kg	Rock Support No. of Rockbolts	Rock Support Shotcrete	Comments
0.35	1.39	DELAY	-	-	-	-	POT SCREW CLAMP BROKEN, CHANGE RUBBERS
1.39	2.15	SHOTCRETING					
2.15	2.36	DELAY	-	-	-	-	WAIT FOR CEMENT
2.36	3.15	SHOTCRETING					
3.15	3.55	LUNCH BREAK					
3.55	4.30	SHOTCRETING					
4.30	4.50	DELAY	-	-	-	-	WAIT FOR CEMENT
4.50	5.06	SHOTCRETING					
5.06	5.20	DELAY	-	-	-	-	WAIT FOR CEMENT
5.20	5.30	SHOTCRETING				990-1000m CROWN	
5.30	5.50	DELAY	-	-	-	-	TROUBLE WITH CONVEYOR
5.50	6.05	SHOTCRETING					
6.05	6.20	DELAY	-	-	-	-	WAIT FOR CEMENT
6.20	6.50	SHOTCRETING					
6.50	7.05	DELAY	-	-	-	-	WAIT FOR CEMENT
7.05	7.35	SHOTCRETING				976-989m CROWN	
		----SHIFT CHANGE-----					
8.00	8.30	DELAY	-	-	-	-	WAIT FOR CEMENT
8.30	8.50	SHOTCRETING					
8.50	9.15	DELAY	-	-	-	-	WAIT FOR CEMENT
9.15	9.30	SHOTCRETING					
9.30	9.35	DELAY	-	-	-	-	WAIT FOR CEMENT
9.35	10.00	SHOTCRETING					
10.00	10.20	SHOTCRETING				955-975m CROWN	
10.30	11.55	CONSTRUCTION SERVICES	-	-	-	-	REMOVE TWO LENGTHS OF VENTTUBING AND INSTALL ONE.
11.55	16.00	DELAY	-	-	-	-	SCISSOR LIFT DOWN
13.30	14.50	MESH INSTALLATION	-	-	-	-	DRILL HOLES
14.50	16.00	MESH INSTALLATION					
		----SHIFT CHANGE-----					
16.00	24.00	MESH INSTALLATION AND SCALING	-	-	-	-	INSTALL 2 m. ROCKBOLTS REMOVE VENT TUBES IN PREPARATION FOR REMEDIAL SHOTCRETE
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project

Rock Support Interaction Study

DAILY REPORT (Tunnel # 3)

Date FEBRUARY 11,1983 File Name: T3-11-02-83

Chainage :Start 1023.00 m (APPROX.)

End 1023.00 m (APPROX.) Project No: 831-6014

Advance for day 0.00 m

Time (hours)		Activity	Blasting		Rock Support		Comments
Start	End		No. of Bt.Hls	Weight of Powder kg	No. of Rockbolts	Shotcrete	
0.00	8.00	MESH INSTALLATION AND SCALING					ALSO REMOVE VENT TUBING
8.00	8.50	DELAY	-	-	-	-	WAIT FOR INSTRUCTIONS
8.50	11.30	MESH INSTALLATION	-	-	-	-	ALSO DRILL HOLES
11.30	12.30	DRILL HOLES	-	-	-	-	(1003-1023 m)
13.00	15.00	INSTRUMENTATION					READ CONVERGENCE POINTS
13.30	14.20	SHOTCRETING	-	-	-	-	SET UP EQUIPMENT
14.20	14.23	SHOTCRETING					
14.23	14.40	DELAY	-	-	-	-	BELT DOWN
14.40	14.55	SHOTCRETING					
14.55	15.10	DELAY	-	-	-	-	WAIT FOR TRUCK
15.10	15.30	SHOTCRETING				1003-1023m CROWN	
15.30	16.00	DELAY	-	-	-	-	WAIT FOR TRUCK AND REPAIR LIGHTS
		----SHIFT CHANGE-----					
16.00	16.45	DELAY	-	-	-	-	CHANGE HOSE
16.45	16.50	SHOTCRETING					
16.50	17.20	DELAY	-	-	-	-	BROKEN VIBRATOR
17.20	17.45	SHOTCRETING					
17.45	18.05	DELAY	-	-	-	-	CHANGE TRUCKS, REPAIR VIBR. POT NIPPLE
18.05	18.35	SHOTCRETING					
18.35	19.20	DELAY	-	-	-	-	CHANGE TRUCK, COFFEE BREAK
19.20	19.55	SHOTCRETING					
19.55	20.05	DELAY	-	-	-	-	TIGHTEN UP MOTOR
20.05	20.30	SHOTCRETING					
20.30	20.40	DELAY	-	-	-	-	CHANGE WATER
20.40	21.05	SHOTCRETING					
21.05	21.10	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
21.10	21.40	SHOTCRETING					
21.40	22.40	DELAY	-	-	-	-	BATCH 2 TRUCKS SETUP, COFFEE BREAK
22.40	23.00	SHOTCRETING					
23.00	23.15	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
23.15	23.40	SHOTCRETING				904-918m CROWN	
23.40	24.00	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
		----SHIFT CHANGE-----					

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
DAILY REPORT (Tunnel # 3)

Date FEBRUARY 12,1983
Chainage :Start 1023.00 m (APPROX.)
End 1023.00 m (APPROX.)
Advance for day 0.00 m

File Name: T3-12-02-83

Project No: 831-6014

Time (hours) Start	Time (hours) End	Activity	Blasting: No. of Bt.Hls	Blasting: Weight of Powder kg	Rock Support: No. of Rockbolts	Rock Support: Shotcrete	Comments
0.00	0.39	DELAY	-	-	-	-	UNDEFINED
0.39	1.17	SHOTCRETING					
1.17	1.23	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
1.23	1.45	SHOTCRETING					
1.45	2.07	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
2.07	2.34	SHOTCRETING				904-918a CROWN	
2.34	2.52	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
2.52	3.10	SHOTCRETING					
3.10	3.35	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
3.35	3.58	SHOTCRETING				908-916a E. SIDEWALL	
3.58	4.17	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
4.17	4.45	SHOTCRETING					
4.45	5.12	DELAY	-	-	-	-	WAIT FOR SHOTCRETE
5.12	5.41	SHOTCRETING				906-918a W. SIDEWALL	
5.41	8.00	CLEAN UP ----SHIFT CHANGE----					

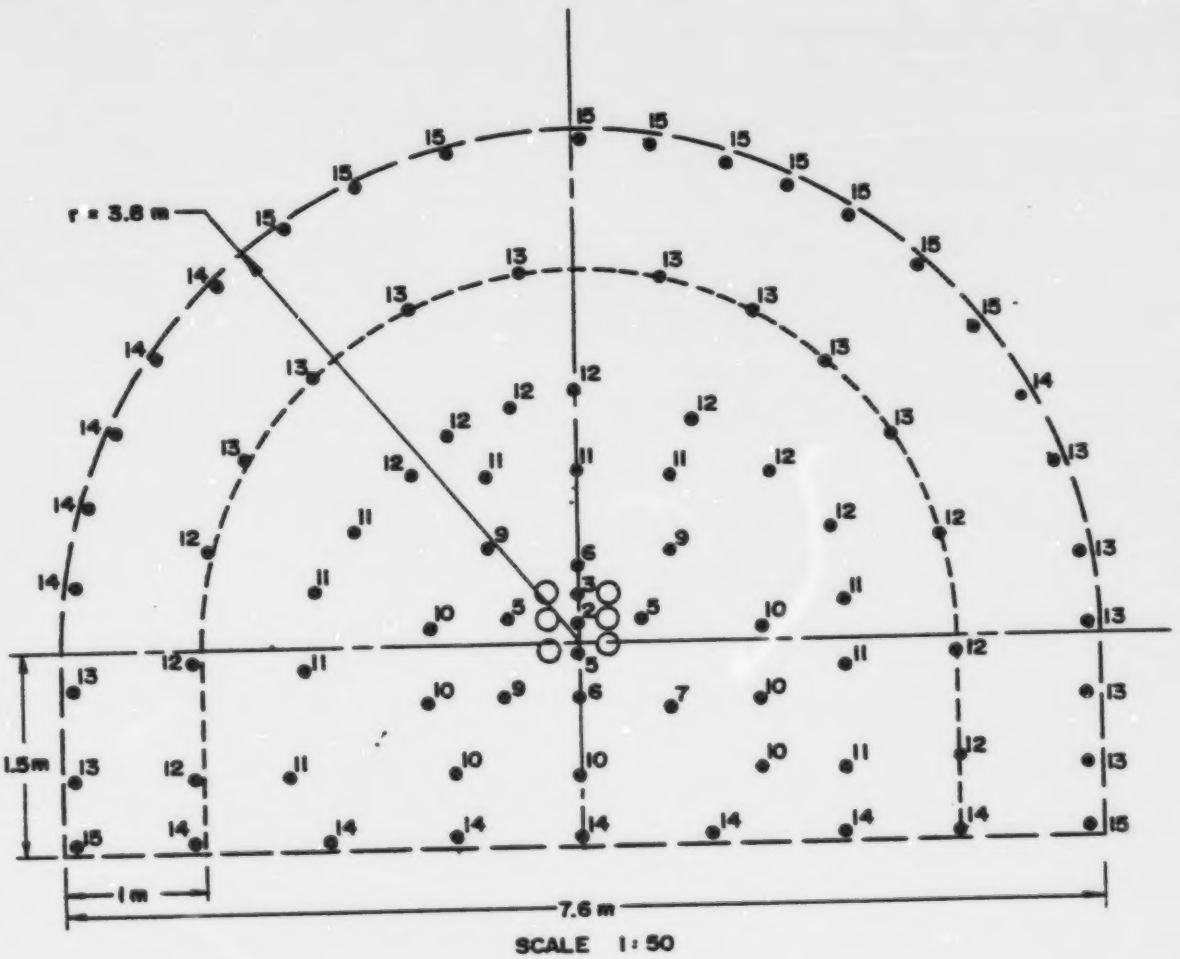
Notes:

APPENDIX A-3

TUNNEL NO. 3 - BLASTING RECORDS

TYPICAL BLAST DESIGN
CHAINAGE 152.08 m. TO 157.40 m.

FIGURE A.1



SCALE 1:50

DATA

DATE : March 15.82 to 20.82
DEPTH OF HOLE: 3.66 m
FACE ADVANCE : 2.32 - 3.00 m
CHAINAGE : 152.08 to 157.40 m
NUMBER OF HOLES DRILLED : 82-88
NUMBER OF HOLES LOADED : 73-81

EXPLOSIVES

PRODUCTION : TOVEX 320
CUT : GELEX 70%
PERIMETER : TOVEX 320
LIFTERS : GELEX 70%

OVERBREAK

W. SPRINGLINE : 0.380 - 0.409 m
W. HAUNCH 45° : 0.405 - 0.450 m
BACK : 0.375 - 0.420 m
E. HAUNCH 45° : 0.375 - 0.450 m
E. SPRINGLINE : 0.390 - 0.430 m

LEGEND

○ REAMED HOLES 78 mm Ø
● LOADED HOLE 44 mm Ø
o UNLOADED HOLES 44 mm Ø
●3 — DELAY NUMBER

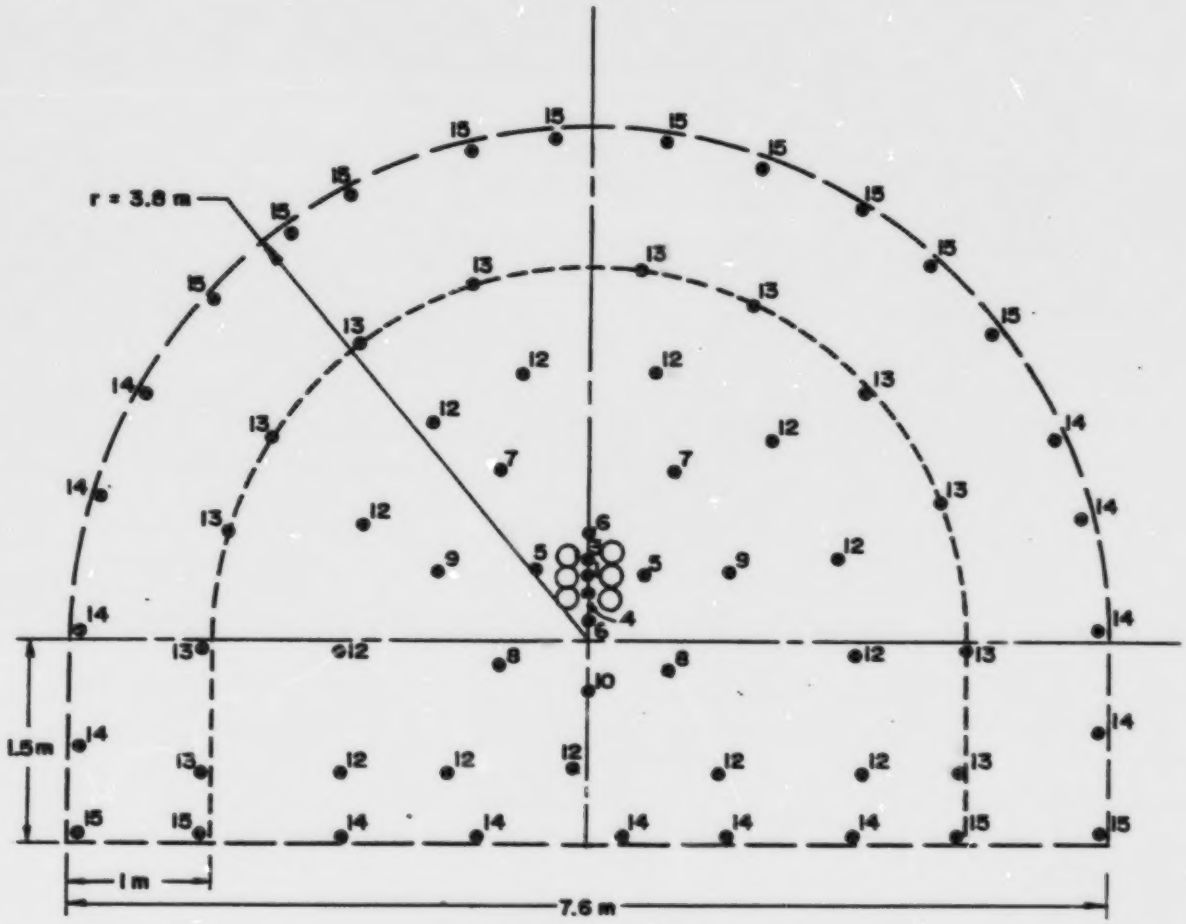
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 159.75m. TO 169.60m.

FIGURE A.2



DATA

DATE	: March 22.82 to 27.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 1.45 - 3.66 m
CHAINAGE	: 159.75 to 169.60 m
NUMBER OF HOLES DRILLED	: 71-87
NUMBER OF HOLES LOADED	: 65-80

OVERBREAK

W. SPRINGLINE	: 0.355 - 0.420 m
W. HAUNCH 45°	: 0.385 - 0.420 m
BACK	: 0.390 - 0.410 m
E. HAUNCH 45°	: 0.380 - 0.460 m
E. SPRINGLINE	: 0.385 - 0.450 m

EXPLOSIVES

PRODUCTION	: TOVEX 320
CUT	: GELEX 70%
PERIMETER	: TOVEX 320, TOVEX 330
LIFTERS	: TOVEX 320

LEGEND

- ○ REAMED HOLES 78 mm ϕ
- ● LOADED HOLE 44 mm ϕ
- o UNLOADED HOLES 44 mm ϕ
- ●3 — DELAY NUMBER

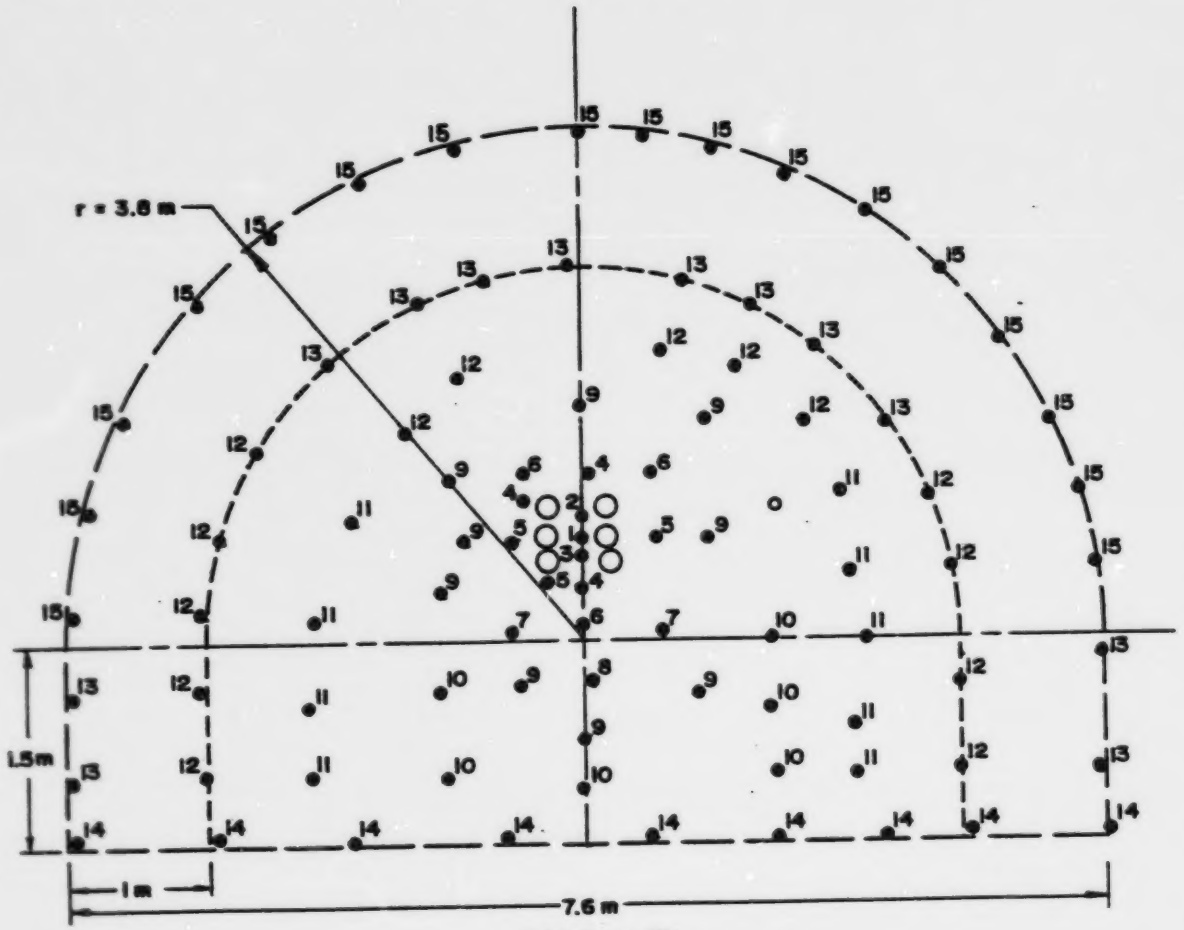
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 172.80 m. TO 197.90 m.

FIGURE A.3



DATA

DATE	: March 29.82 to April 03.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 1.90 - 3.66 m
CHAINAGE	: 172.80 to 197.90
NUMBER OF HOLES DRILLED	: 81-99
NUMBER OF HOLES LOADED	: 75-93

EXPLOSIVES

PRODUCTION	: TOVEX 326, GELEX 70%
CUT	: GELEX 70%
PERIMETER	: TOVEX 330
LIFTERS	: GELEX 70%

OVERBREAK

W. SPRINGLINE	: 0.385 - 0.434 m
W. HAUNCH 45°	: 0.355 - 0.510 m
BACK	: 0.375 - 0.440 m
E. HAUNCH 45°	: 0.375 - 0.500 m
E. SPRINGLINE	: 0.370 - 0.480 m

LEGEND

- ○ REAMED HOLES 78 mm ø
- ● LOADED HOLE 44 mm ø
- o UNLOADED HOLES 44 mm ø
- 3—DELAY NUMBER

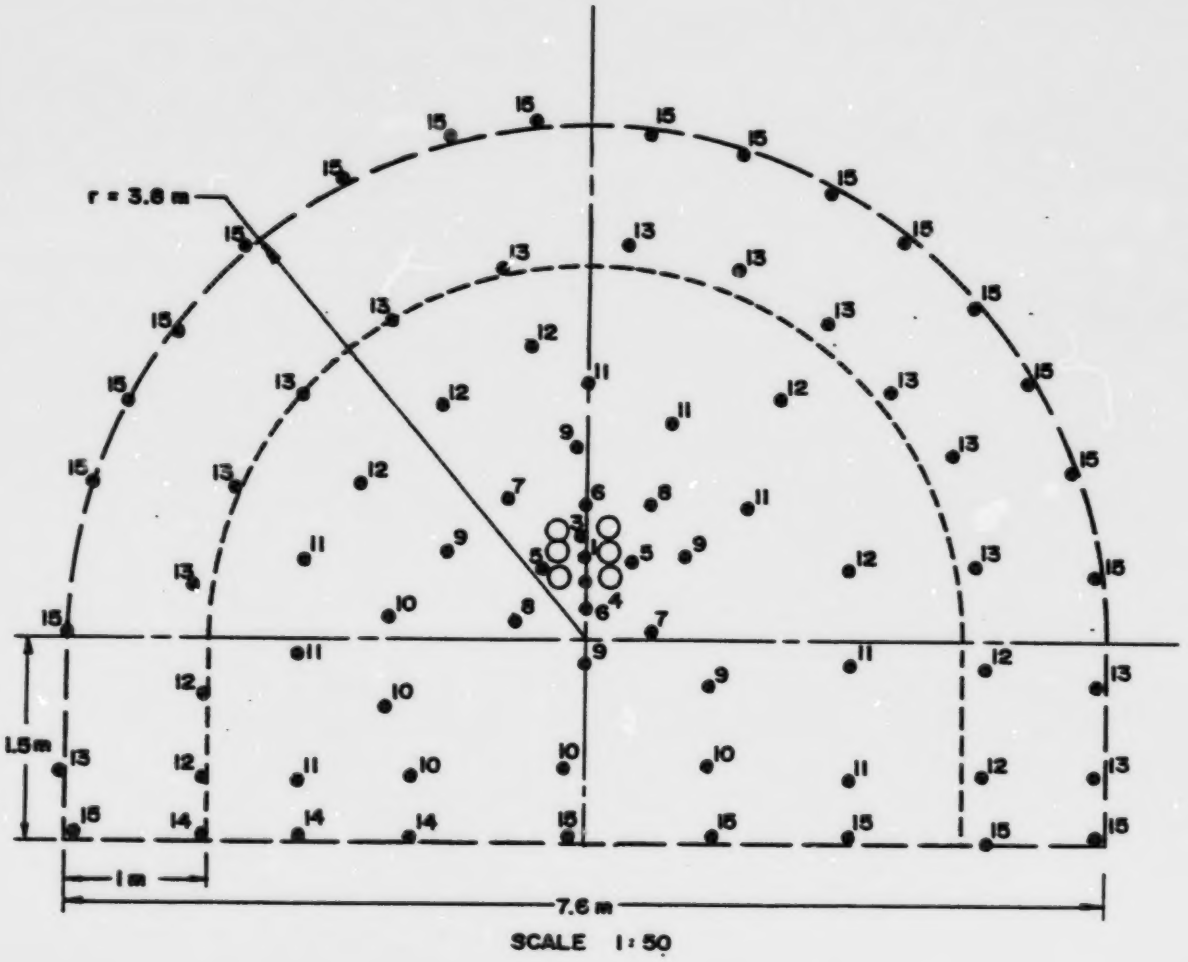
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 201.30m. TO 212.08m.

FIGURE A.4



SCALE 1:50

DATA

DATE	: April 11.82 to 17.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 2.40 - 3.00 m
CHAINAGE	: 201.30 to 212.08 m
NUMBER OF HOLES DRILLED	: 81-91
NUMBER OF HOLES LOADED	: 76-85

OVERBREAK

W. SPRINGLINE	: 0.354 - 0.415 m
W. HAUNCH 45°	: 0.354 - 0.412 m
BACK	: 0.420 - 0.490 m
E. HAUNCH 45°	: 0.360 - 0.450 m
E. SPRINGLINE	: 0.360 - 0.400 m

EXPLOSIVES

PRODUCTION	: TOVEX 326
CUT	: GELEX 70%
PERIMETER	: TOVEX 320
LIFTERS	: GELEX 70%

LEGEND

- ○ REAMED HOLES 78 mm ø
- ● LOADED HOLE 44 mm ø
- o UNLOADED HOLES 44 mm ø
- 3—DELAY NUMBER

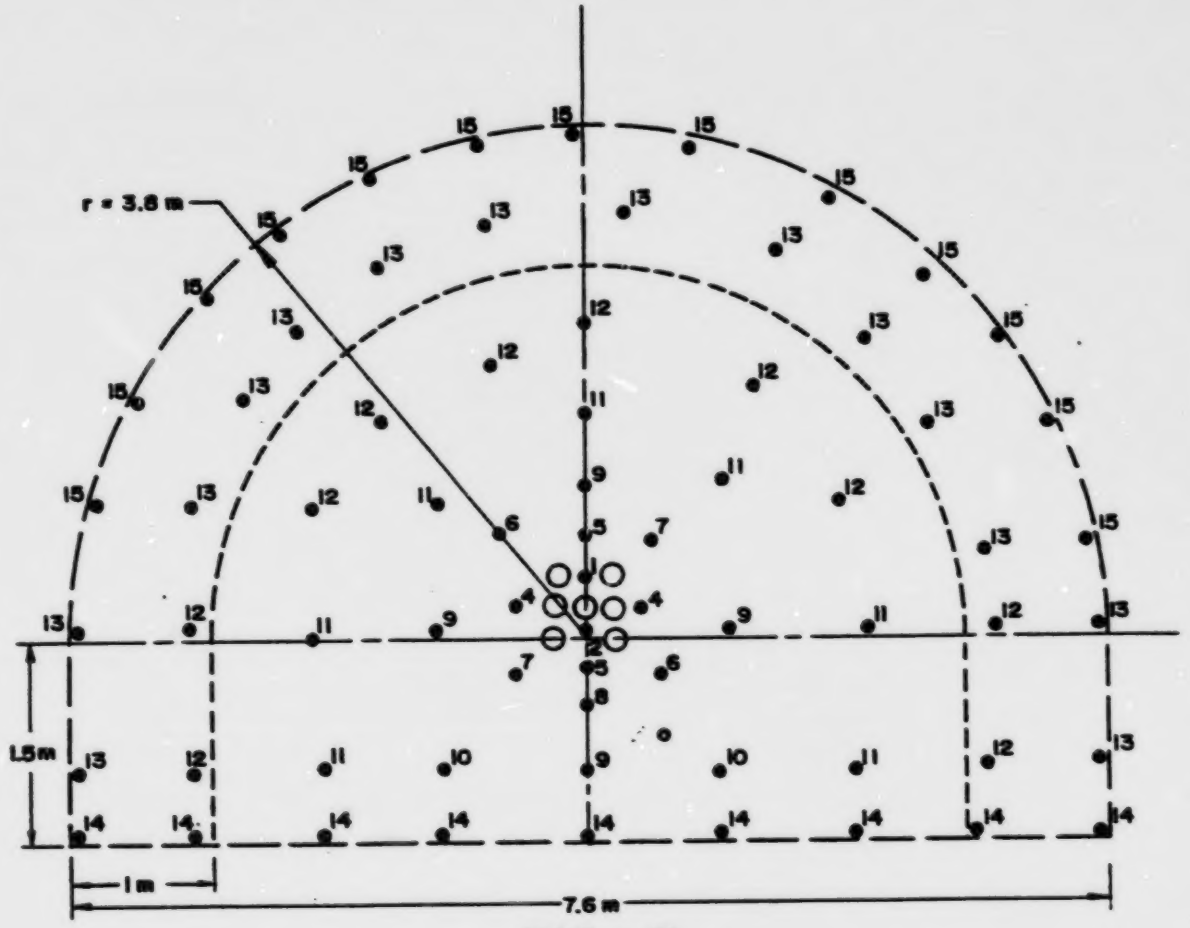
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 440.70m. TO 459.67 m.

FIGURE A.5



SCALE 1:50

DATA

DATE	: June 27.82 to July 03.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 2.86 - 3.50 m
CHAINAGE	: 440.70 to 459.67
NUMBER OF HOLES DRILLED	: 67-84
NUMBER OF HOLES LOADED	: 60-70

EXPLOSIVES

PRODUCTION	: TOVEX 326
CUT	: TOVEX 326
PERIMETER	: TRIMTEX, TOVEX 326
LIFTERS	: TOVEX 326

OVERBREAK

W. SPRINGLINE	: 0.350 - 0.405 m
W. HAUNCH 45°	: 0.340 - 0.387 m
BACK	: 0.358 - 0.440 m
E. HAUNCH 45°	: 0.345 - 0.400 m
E. SPRINGLINE	: 0.340 - 0.420 m

LEGEND

- ○ REAMED HOLES 78 mm ϕ
- ● LOADED HOLE 44 mm ϕ
- o UNLOADED HOLES 44 mm ϕ
- 3—DELAY NUMBER

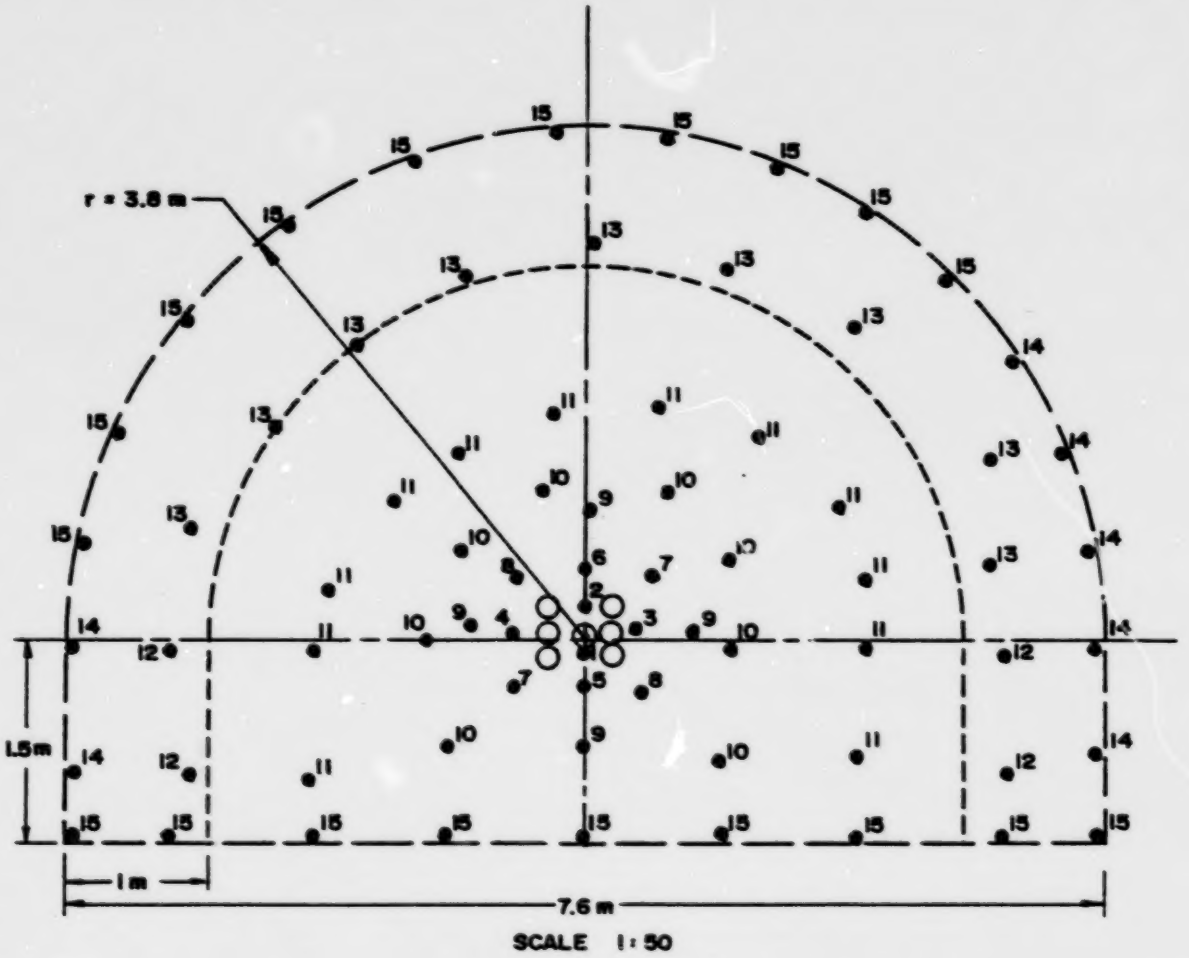
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 462.53 m TO 484.91 m

FIGURE A.6



SCALE 1:50

DATA

DATE	: July 04.82 to 10.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 2.00 to 3.66 m
CHAINAGE	: 462.53 to 484.91 m
NUMBER OF HOLES DRILLED	: 72-82
NUMBER OF HOLES LOADED	: 65-77

OVERBREAK

W. SPRINGLINE	: 0.355 - 0.405 m
W. HAUNCH 45°	: 0.360 - 0.410 m
BACK	: 0.345 - 0.385 m
E. HAUNCH 45°	: 0.293 - 0.450 m
E. SPRINGLINE	: 0.345 - 0.393 m

EXPLOSIVES

PRODUCTION	: TOVEX 326
CUT	: TOVEX 326
PERIMETER	: TRIMTEX, TOVEX 326
LIFTERS	: TOVEX 326

LEGEND

- ○ REAMED HOLES 78 mm ø
- ● LOADED HOLE 44 mm ø
- o UNLOADED HOLES 44 mm ø
- 3—DELAY NUMBER

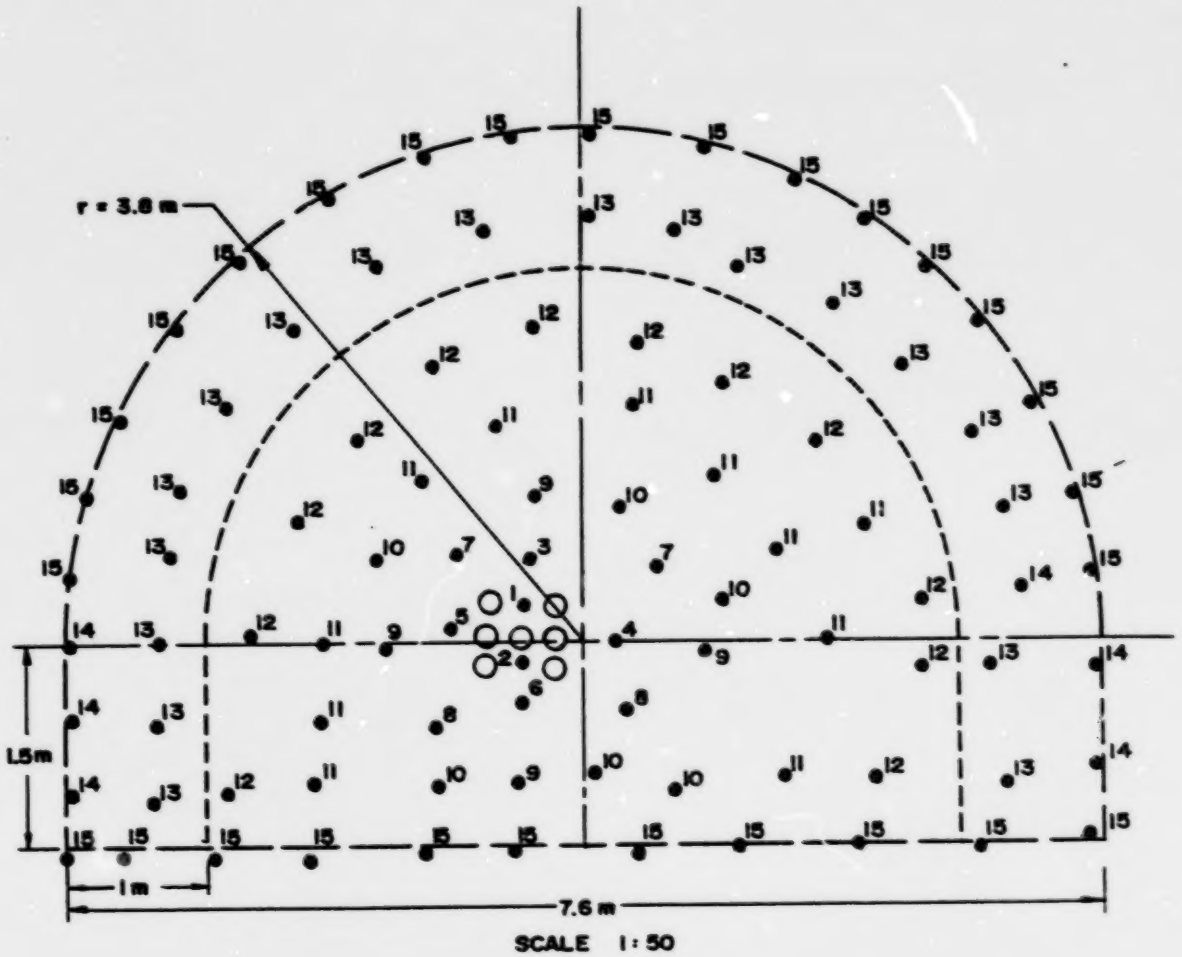
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 783.82 m TO 798.00 m

FIGURE A.7



SCALE 1 : 50

DATA

DATE	: November 07.82 to 13.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 3.00-3.50 m (REBLASTS)
CHAINAGE	: 783.82 to 798.00 m
NUMBER OF HOLES DRILLED	: 78-102
NUMBER OF HOLES LOADED	: 68-95

EXPLOSIVES

PRODUCTION	: TOVEX 326
CUT	: TOVEX 326
PERIMETER	: TRIMTEX, TOVEX (TUBES)
LIFTERS	: TOVEX 326

OVERBREAK

W. SPRINGLINE	: 0.365 - 0.405 m
W. HAUNCH 45°	: 0.360 - 0.395 m
BACK	: 0.370 - 0.415 m
E. HAUNCH 45°	: 0.370 - 0.425 m
E. SPRINGLINE	: 0.375 - 0.425 m

LEGEND

- ○ REAMED HOLES 78 mm Ø
- ● LOADED HOLE 44 mm Ø
- ○ UNLOADED HOLES 44 mm Ø
- ●3 — DELAY NUMBER

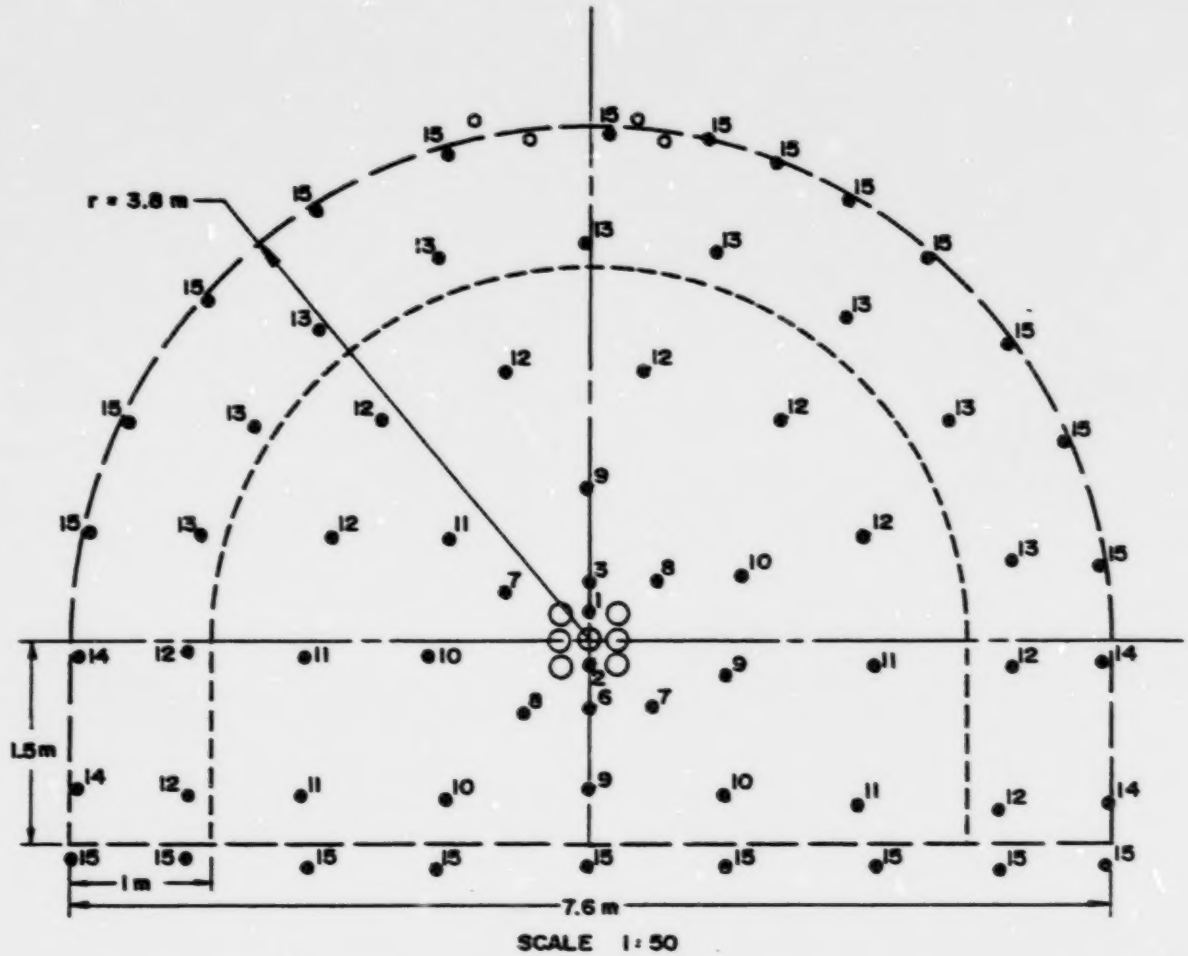
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 800.03 m TO 815.17 m

FIGURE A.8



SCALE 1:50

DATA

DATE	: November 14.82 to 20.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 2.60 - 3.30 m
CHAINAGE	: 800.03 to 815.17
NUMBER OF HOLES DRILLED	: 77-88
NUMBER OF HOLES LOADED	: 66-76

OVERBREAK

W. SPRINGLINE	: 0.375 - 0.420 m
W. HAUNCH 45°	: 0.350 - 0.385 m
BACK	: 0.380 - 0.415 m
E. HAUNCH 45°	: 0.390 - 0.410 m
E. SPRINGLINE	: 0.380 - 0.430 m

EXPLOSIVES

PRODUCTION	: TOVEX 326
CUT	: TOVEX 326
PERIMETER	: TRIMTEX, TOVEX 326
LIFTERS	: TOVEX 326, TUBES

LEGEND

- ○ REAMED HOLES 78 mm ø
- ● LOADED HOLE 44 mm ø
- o UNLOADED HOLES 44 mm ø
- 3 — DELAY NUMBER

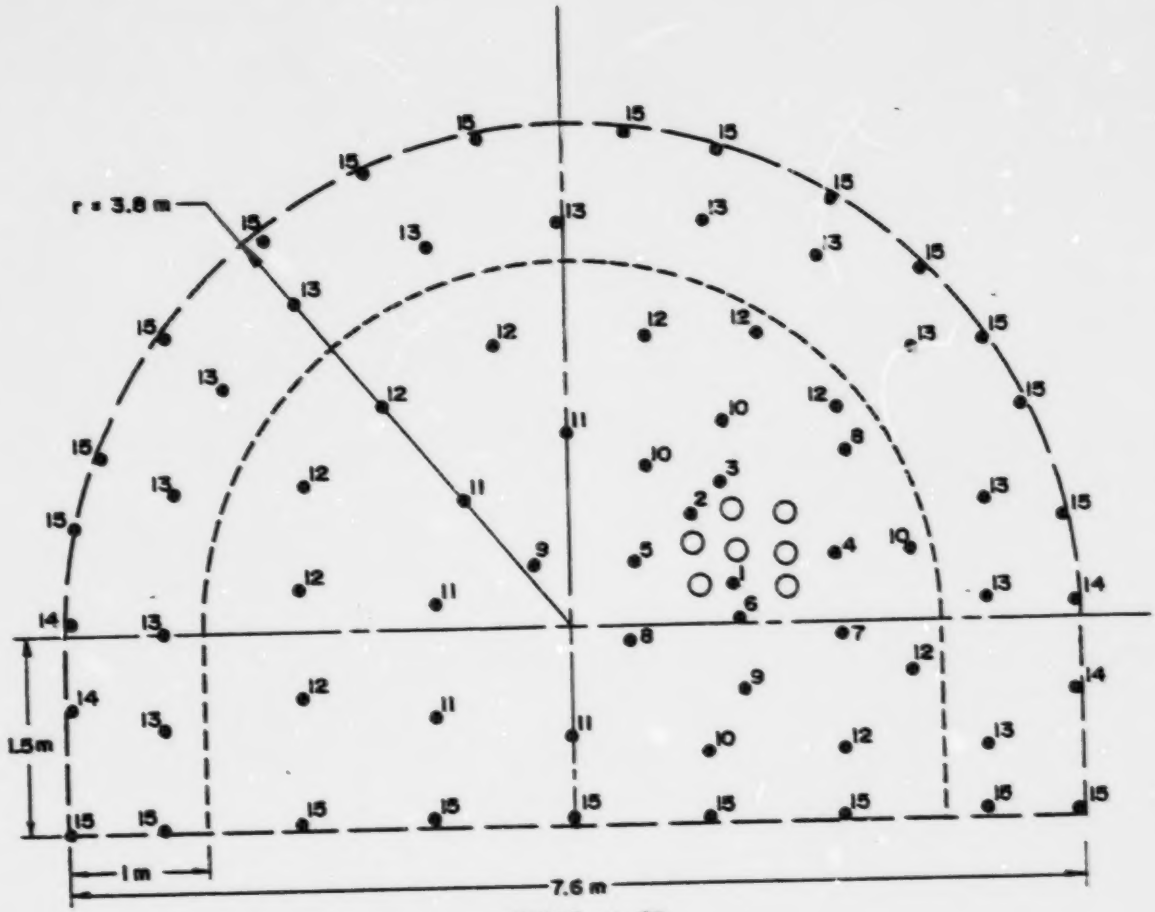
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 892.48 m TO 915.17 m

FIGURE A.9



SCALE 1 : 50

DATA

DATE	: December 12.82 to 31.82
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 2.80 - 3.66 m
CHAINAGE	: 892.48 to 915.17 m
NUMBER OF HOLES DRILLED	: 71-79
NUMBER OF HOLES LOADED	: 63-73

EXPLOSIVES

PRODUCTION	: TOVEX 326
CUT	: TOVEX 326
PERIMETER	: TRIMTEX TUBES, TOVEX 326
LIFTERS	: TOVEX TUBES

OVERBREAK

W. SPRINGLINE	: 0.380 - 0.415 m
W. HAUNCH 45°	: 0.365 - 0.390 m
BACK	: 0.350 - 0.385 m
E. HAUNCH 45°	: 0.360 - 0.395 m
E. SPRINGLINE	: 0.385 - 0.390 m

LEGEND

- ○ REAMED HOLES 78 mm ϕ
- ● LOADED HOLE 44 mm ϕ
- o UNLOADED HOLES 44 mm ϕ
- ●3 — DELAY NUMBER

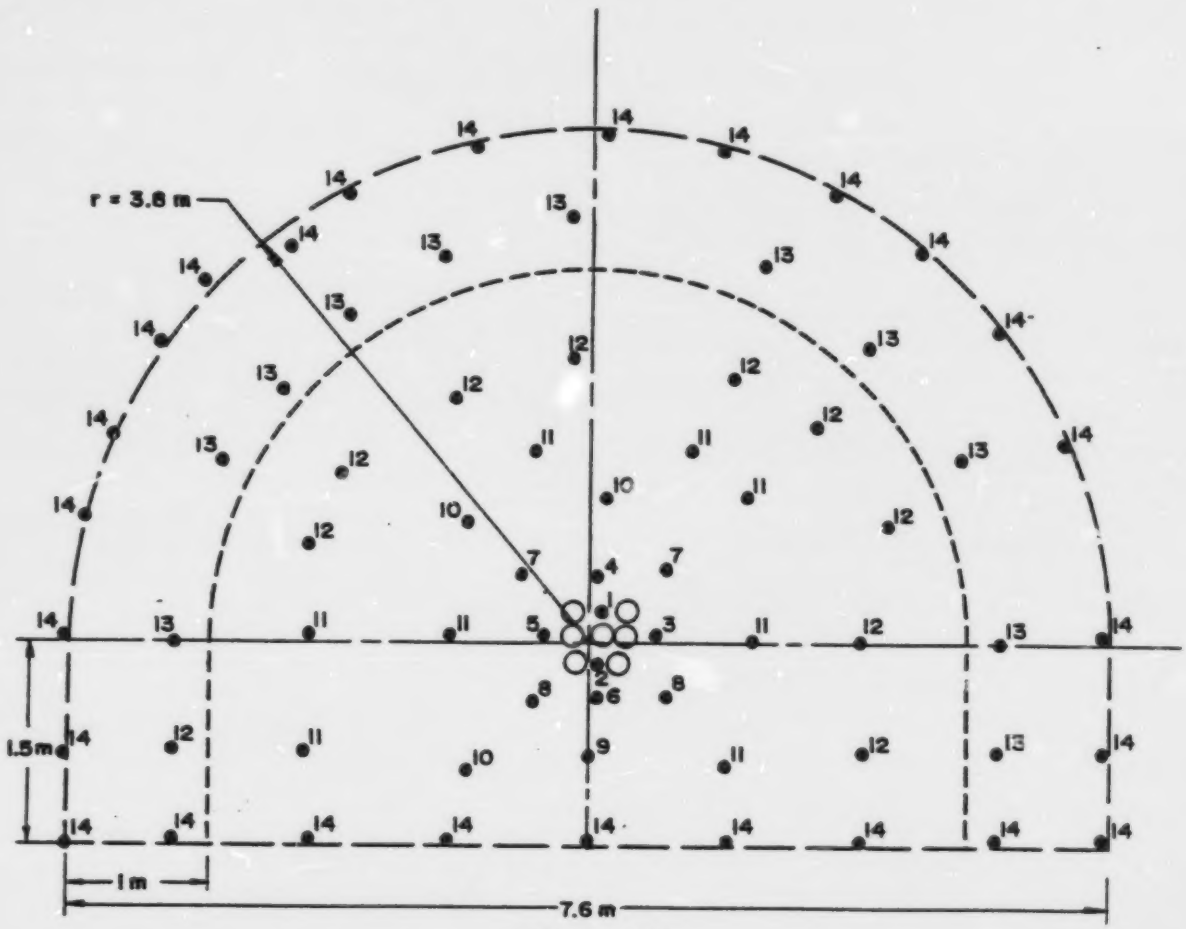
Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

TYPICAL BLAST DESIGN
CHAINAGE 1009.90m TO 1023.00 m.

FIGURE A.10



SCALE 1:50

DATA

DATE	: February 06.83 to 12.83
DEPTH OF HOLE	: 3.66 m
FACE ADVANCE	: 3.30 - 3.66 m
CHAINAGE	: 1009.90 to 1023.0 m
NUMBER OF HOLES DRILLED	: 73-78
NUMBER OF HOLES LOADED	: 66-68

OVERBREAK

W. SPRINGLINE	: N/A
W. HAUNCH 45°	: N/A
BACK	: N/A
E. HAUNCH 45°	: N/A
E. SPRINGLINE	: N/A

EXPLOSIVES

PRODUCTION	: TOVEX 326
CUT	: TOVEX 326
PERIMETER	: TRIMEX TUBES, TOVEX 326
LIFTERS	: TOVEX TUBES

LEGEND

- ○ REAMED HOLES 78 mm ø
- ● LOADED HOLE 44 mm ø
- ○ UNLOADED HOLES 44 mm ø
- ●3 — DELAY NUMBER

Date FEB. 11, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

APPENDIX B-1

BOREHOLE LOGS
(prepared by CBDC)

TUNNEL NO. 2 - BOREHOLE LOGS

June 1985

831-6014

LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

WEATHERING STATE

Fresh: no visible sign of weathering.

Faintly weathered: weathering limited to the surface of major discontinuities.

Slightly weathered: penetrative weathering developed on open discontinuity surfaces but only slight weathering of rock material.

Moderately weathered: weathering extends throughout the rock mass but the rock material is not friable.

Highly weathered: weathering extends throughout rock mass and the rock material is partly friable.

Completely weathered: rock is wholly decomposed and in a friable condition but the rock texture and structure are preserved.

BEDDING THICKNESS

Description	Bedding Plane Spacing
Very thickly bedded	> 2 m
Thickly bedded	0.6 m to 2m
Medium bedded	0.2 m to 0.6 m
Thinly bedded	60 mm to 0.2 m
Very thinly bedded	20 mm to 60 mm
Laminated	6 mm to 20 mm
Thinly laminated	< 6 mm

JOINT OR FOLIATION SPACING

Description	Spacing
Very wide	> 3 m
Wide	1 - 3 m
Moderately close	0.3 - 1 m
Close	50 - 300 mm
Very close	< 50 mm

GRAIN SIZE

Term	Size*
Very Coarse Grained	> 60 mm
Coarse Grained	2 - 60 mm
Medium Grained	60 microns - 2 mm
Fine Grained	2 - 60 microns
Very Fine Grained	< 2 microns

Note: * Grains >60 microns diameter are visible to the naked eye.

CORE CONDITION

Total Core Recovery

The percentage of solid drill core recovered regardless of quality or length, measured relative to the length of the total core run.

Solid Core Recovery (SCR)

The percentage of solid drill core, regardless of length, recovered at full diameter, measured relative to the length of the total core run.

Rock Quality Designation (RQD)

The percentage of solid drill core, greater than 100 mm length, recovered at full diameter, measured relative to the length of the total core run. RQD varies from 0% for completely broken core to 100% for core in solid sticks.

DISCONTINUITY DATA

Fracture Index

A count of the number of discontinuities (physical separations) in the rock core, including both naturally occurring fractures and mechanically induced breaks caused by drilling.

Dip with Respect to (W.R.T.) Core Axis

The angle of the discontinuity relative to the axis (length) of the core. In a vertical borehole a discontinuity with a 90° angle is horizontal.

Description and Notes

An abbreviated description of the discontinuities, whether naturally occurring separations such as fractures, bedding planes and foliation planes or mechanically induced features caused by drilling such as ground or shattered core and mechanically separated bedding or foliation surfaces. Additional information concerning the nature of fracture surfaces and infillings are also noted.

Abbreviations

B - Bedding	P - Polished
FO - Foliation Schistosity	S - Slickensided
CL - Cleavage	SM - Smooth
SH - Shear Plane Zone	R - Ridged Rough
VN - Vein	ST - Stepped
F - Fault	PL - Planar
CO - Contact	FL - Flexured
J - Joint	UE - Uneven
FR - Fracture	W - Wavy
MF - Mechanical Fracture	C - Curved
ll - Parallel To	
⊾ - Perpendicular To	

Form...G.A.-R-3 (m)

RECORD OF BOREHOLE 2T915EA

SHEET 1 OF 2

LOCATION Tunnel No. 3 CH 915 m

BORING DATE MARCH 30, 1984

DATUM

INCLINATION 90° AZIMUTH

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
0	ROTARY DIAMOND DRILLING & Rock CORE	FRESH THICKLY TO MEDIUM BEDDED MEDIUM GRAINED MEDIUM GREY SANDSTONE OCCASIONALLY COARSE GRAINED		193.95 0.0	1	SA S.A.											
1				155.06													
		FAIRLY FRACTURED SANDSTONE WITH COALY PARTINGS		1.50 155.88													
				1.73													
2		FINE TO MEDIUM GRAINED THICKLY BEDDED SANDSTONE			2	"											
3				156.54													
		MUDSTONE CONGLOMERATE CLASTS IN COARSE GRAINED SANDSTONE MATRIX		2.19													
				157.24	3	"											
		INTERBEDDED SILTSTONE / SANDSTONE		3.69													
4				157.74													
		SANDSTONE MEDIUM GREY, LIGHT GREY WITH OCCASIONAL MUDSTONE CLASTS		4.19	4	"											
5																	
6				159.92													
		MUDSTONE CONGLOMERATE CLASTS IN MEDIUM TO COARSE GRAINED SANDSTONE MATRIX. COALY MATERIAL		6.37	5	"											
7				160.75													
		FRESH THICKLY TO MED. BEDDED MED. GRAINED MED. GREY SANDSTONE		7.20													
8				161.61													
		INTERBEDDED SILTSTONE / SANDSTONE		8.06	6	"											
				162.11													
		FRESH MEDIUM GREY THINLY BEDDED SILTSTONE		8.56													
9					7	"											
10		CONTINUED ON SHEET 2															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED SL. DRAWN G.P.

DATE MAY 25 1988 CHECKED —

RECORD OF BOREHOLE 2T915EA

SHEET 2 OF 2

LOCATION Tunnel no. 2 Ch 915 m — BORING DATE MARCH 30,1964 — DATUM

INCLINATION 90° AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
10		CONTINUED FROM SHEET 1		163.56 10.21													
				10.10													
				164.25 10.70			88 B.C.										
		HIGHLY FRACTURED CARBONACEOUS SANDSTONE		163.62 10.87													
11					8												
		SANDSTONE MEDIUM TO COARSE GRAINED CONTAINING COAL ON PARTINGS CLAY MATRIX															
12				163													
				166.99 12.74	9												
13																	
14					10												
15		INTERLAMINATED SILTSTONE / SANDSTONE WITH FREQUENT CARBONACEOUS PARTINGS															
					11												
16																	
17				170	12												
18				171.43	13												
		GRADATIONAL CONTACT WITH OVERLYING TYPE		172.11													
		END OF HOLE		856													
19																	
20																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN G.P.
DATE MAY 23, 1965 CHECKED

RECORD OF BOREHOLE 2T915ED

SHEET 1 OF 2

LOCATION Tunnel No. 2, Ch 915 | BORING DATE MARCH 29, 1984 | DATUM SEA LEVEL

INCLINATION 90° AZIMUTH | SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3m	WATER CONTENT, % (Wp — W — Wl)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.1m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
0	ROTARY DIAMOND DRILLING B.Q. Rock Core	TUNNEL INVERT		162.55													
		(BASE OF PORTAL SAND STONE BELOW INVERT) FRESH TINGLY TO MED. BEDDED MED. GRAINED, MED. GREY SANDSTONE		00 163.20 0.65 163.50 0.95	1	Rock Core											
1		INTERBEDDED SILTSTONE / MUDSTONE		164.26 1.71													
2		INTERBEDDED SILTSTONE / MUDSTONE, TO MUDSTONE		164.85 2.30	2												
3		INTERBEDDED SILTSTONE / MUDSTONE			3												
4					4												
5																	
6					5												
7				169.71 7.16													
		SILTSTONE		170													
8					6												
9				171.55 9.00													
		INTERBEDDED SILTSTONE / MUDSTONE			7												
10		CONTINUED ON SHEET 2															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED SL. DRAWN S.P.
DATE MAY 24, 1985 CHECKED —

RECORD OF BOREHOLE 2T915ED

SHEET 2 OF 2

LOCATION Tunnel No. 2 Ch 915 m

BORING DATE MARCH 29, 1984

DATUM

INCLINATION 90° | AZIMUTH

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3m	WATER CONTENT, % (Wp — W — Wl)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP / DIP DIRECTION	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, K, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
10	Rotary diamond drilling B.H. Rock core	CONTINUED FROM SHEET 1															
		INTERBEDDED SILTSTONE / MUDSTONE		172.05		SA RC											
		SANDSTONE		10.78	6												
11		END OF HOLE		172.46 11.21													
12																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN G.P.
DATE MAY 24, 1985 CHECKED [illegible]

RECORD OF BOREHOLE 2T 1420 EA

SHEET 1 OF 4

LOCATION Tunnel no. 2 CH 1420 m

BORING DATE MAY 26, 1994

DATUM

INCLINATION 90° ◊ AZIMUTH

SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX per 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
0				0.00													
		MEDIUM GREY, THINLY BEDDED SILTSTONE			1	DB, R.C.											
		HIGHLY FRACTURED MUDSTONE		1.49													
		BRIGHT TO DULL COAL WITH PYRITE STRINGERS McCURDY COAL SEAM		1.72	2												
		SILTSTONE AND MUDSTONE CLASTS IN SANDY MATRIX MUDSTONE CONGLOMERATES		3.38	3												
		FINE TO MEDIUM GRAINED MEDIUM GREY CONTAINING MINOR CARBONACEOUS LAMINATIONS, MINOR MUDSTONE BANDS OF MUDSTONE CONGLOMERATE AND OR SILTSTONE / MUDSTONE INTERBEDS. SANDSTONE.		5.02	4												
					5												
					6												
					7												
10		CONTINUED ON SHEET 2															

ROTARY DIAMOND DRILLING B.Q. Rock Core

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED SL. DRAWN D.M.
DATE MAR. 4, 1995 CHECKED dc

RECORD OF BOREHOLE 2T 1420 EA

SHEET 2 OF 4

LOCATION Tunnel No. 2 Ch 1420 m

BORING DATE MAY 28, 1984

DATUM

INCLINATION 90° | AZIMUTH

SAMPLER / PENETRATION TEST HAMMER WEIGHT

DROP

PROJECT 831-5614

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	DISCONTINUITY DATA: FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA: DIP/DIP DIRECTION	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
10	Rotary diamond drilling B.Q. Rock core	CONTINUED FROM SHEET 1			7	SA R.C.											
11					8												
12																	
13					9												
14		FINE TO MEDIUM GRAINED, MEDIUM GREY CONTAINING MINOR CARBONACEOUS LAMINATIONS, MINOR MUDSTONE; BANDS OF MUDSTONE CONGLOMERATE AND/OR SILTSTONE/MUDSTONE INTERBEDS SANDSTONE			10												
15																	
16					11												
17																	
18					12												
19					13												
20		CONTINUED ON SHEET 3															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

HOLE LOGGED S.L. DRAWN D.M.
DATE MAR. 5, 1985 CHECKED A.G.

RECORD OF BOREHOLE 2T 1420 EA

SHEET 3 OF 4

LOCATION Tunnel No. 2 CH 1420 m — BORING DATE MAY 28, 1984 — DATUM

INCLINATION 90° / AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DESCRIPTION	ELEV DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, %	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	DISCONTINUITY DATA DIP°	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY k, cm/sec	ADDITIONAL TESTING WATER LEVELS AND NOTES	INSTRUMENTATION
20	CONTINUED FROM SHEET 2													
	SANDSTONE													
	LAMINATED SANDSTONE/SILTSTONE	20.22	14											
21	SILTSTONE	20.89	15											
22														
23	FRACTURED MUDSTONE	22.79												
	CARBONACEOUS MUDSTONE AND DIRTY COAL BANDS	23.47	16											
24	BROKEN UP, LISTRIC SURFACES MUDSTONE	24.19												
25	LAMINATED SILTSTONE	24.89	17											
26	SANDSTONE	26.02												
	SILTSTONE	26.46												
	SANDSTONE	26.72	18											
27	INTERLAMINATED SANDSTONE/SILTSTONE	26.99												
	SANDY LAMINATIONS WITH LIGHT BROWN SILTSTONE CLASTS AND/OR LAMINATIONS SILTSTONE	27.35	19											
28														
29			20											
30	CONTINUED ON SHEET 4													

DRILLING RECORD: Astrat diamond drilling 6.6 Coal core

DEPTH SCALE (ALONG HOLE) 1:50 METRIC

ROCK LOGGED S.L. DRAWN D.W.

DATE MAR. 5, 1985 CHECKED

RECORD OF BOREHOLE 2T 1420 EA

SHEET 4 OF 4

LOCATION Tunnel No. 2 CH. 1420m

BORING DATE MAY 28, 1984

DATUM

INCLINATION 90° / AZIMUTH

SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, %	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACTURE FREQ. PER 0.3m	DISCONTINUITY DATA DIP°	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY k, cm/sec	ADDITIONAL TESTING WATER LEVELS AND NOTES	INSTRUMENTATION
30		CONTINUED FROM SHEET 3															
		SANDY LAMINATIONS WITH LIGHT BROWN SILTSTONE CLASTS AND /OR LAMINATIONS SILTSTONE			20	BA, BC											
31					21												
		SEATEARTH		31.80													
32		BRIGHT / LOW - PYRITE CONTENT EMERY COAL SEAM															
					22												
33		CARBONACEOUS MUDSTONE		33.40													
		SEATEARTH															
				33.84													
34					23												
		SOFT HIGHLY FRACTURED MUDSTONE															
35																	
					24												
36																	
37					25												
		CARBONACEOUS MUDSTONE		37.69													
38		INTERBEDDED SILTSTONE / MUDSTONE															
					26												
39																	
		END OF HOLE		39.38													
40																	

ROTARY DIAMOND DRILLING 84 mm Core

DEPTH SCALE (ALONG HOLE)
1:30 METRIC

ROCK LOGGED S.L. DRAWN S.M.
DATE MAR. 9, 1985 CHECKED J.C.

RECORD OF BOREHOLE 2T 1881.38 E.D

SHEET 1 OF 3

LOCATION 2T, CH. 1881.38 — BORING DATE AUG. 3, 1985 — DATUM –

INCLINATION 90° / AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — WL)	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING / WATER LEVELS AND NOTES	INSTRUMENTATION
		TUNNEL INVERT		-185.66													
0	ROTARY DIAMOND DRILLING BX Rock core			0.0	1	SH. R.A.											
1		SILTSTONE															
				-185	2												
2																	
				-186.29													
3		INTERLAMINATED SILTSTONE/MUDSTONE		2.83	3												
				-187.25													
4		SHALEY CARBONACEOUS MUDSTONE		3.19													
				-187.61													
				4.15	4												
5		MEDIUM GREY, SOFT MUDSTONE, HIGH CLAY CONTENT, SHALEY															
				-190	5												
6				-190.16													
7		EMERY COAL SEAM		6.89	6												
				-192.01													
8				8.55													
9		SALTSTONE			7												
10		CONTINUED ON SHEET 2															

DEPTH SCALE (ALONG HOLE) 1:50 METRIC

ROCK LOGGED S.L. DRAWN D.H.

DATE MAR. 7, 1985 CHECKED J.D.

RECORD OF BOREHOLE 2T 1881.38 E.D.

SHEET 2 OF 3

LOCATION 2T, CH. 1881.38

INCLINATION 90° | AZIMUTH

BORING DATE AUG. 3, 1984

DATUM

SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp ○ W WL)	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX per 0.3m	DISCONTINUITY DATA: DIP	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY k, cm/sec	POSITIVE TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
10	ESTABLY DIAMOND DRILLING BX Rock Core	CONTINUED FROM SHEET 1															
		SILTSTONE		-93.61													
				10.15													
		LAMINATED SANDSTONE, SILTSTONE, VERY SILTY			8	SS P.C.											
11				-94.92													
				11.44													
12					9												
13																	
					10												
14		SILTSTONE SLIGHTLY LAMINATED AND/OR CONTAINING LIGHT BROWN SILTSTONE CLAST MATERIAL															
15					11												
16																	
				-200													
				-200.50	12												
17		FRACTURED CARBONACEOUS MUDSTONE		17.04													
				-201.38													
18		INTERBEDDED MUDSTONE / SILTSTONE		17.92	13												
				-202.43													
19		SILTSTONE LIGHT BROWN FINE GRAINED (SILTSTONE) CLASTS		18.97													
				-202.96	14												
		SANDSTONE FINE TO MEDIUM GRAINED		19.50													
20		CONTINUED ON SHEET 3															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN D.M.
DATE MAR. 7, 1985 CHECKED J.W.G.

RECORD OF BOREHOLE 2T 1881.38 E.D.

SHEET 3 OF 3

LOCATION 2T, CH. 1881.38 — BORING DATE AUG. 3, 1984 — DATUM

INCLINATION 90° ↓ AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH, METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — WL)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D., %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
20	Rotary diamond drilling BQ, NQ2, CQ2	CONTINUED FROM SHEET 2															
					14	SA, S.C.											
21		FINE TO MEDIUM GRAINED SANDSTONE			15												
				-20.5													
				-20.544													
22		END OF HOLE		21.97													
23																	
24																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN D.M.
DATE MAR. 7, 1985 CHECKED J.C.

RECORD OF BOREHOLE S.C.-4

SHEET 1 OF 3

LOCATION TUNNEL 2, CH. 880.38 —

BORING DATE AUG. 4, 1984 DATUM

INCLINATION 90° / AZIMUTH

SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, %	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA DIP	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING WATER LEVELS AND NOTES	INSTRUMENTATION
0				-176.55 0.0													
		INTERBEDDED SILTSTONE AND LAMINATED SILTSTONE/ SANDSTONE		-175	1	SP R.C.											
1																	
2					2												
3					3												
4				-172.31 4.24													
5		GRAY SILTSTONE/ MUDSTONE WITH RED SILTSTONE CLASTS			4												
6				-170													
7		MUDSTONE		-169.80 4.75	5												
8				-168.75 7.80	6												
9		SILTSTONE			7												
10		CONTINUED ON SHEET 2															

ROTARY DIAMOND DRILLING
88 ROCK CORE

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN D.M.

DATE MAR. 6, 1985 CHECKED A.D.

RECORD OF BOREHOLE S.C.-4

SHEET 2 OF 5

LOCATION TUNNEL 2, CH. 1891.38 — BORING DATE AUG. 4, 1984. — DATUM

INCLINATION 90° / AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — WL)	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	POSITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
10		CONTINUED FROM SHEET 1															
		SILTSTONE		166.14	7												
				13.41		SA											
11		INTERBEDDED MUDSTONE/ SILTSTONE			8												
				164.77													
		TYPE II: GRADING TO SILTSTONE/ MUDSTONE		11.78													
12				165.30													
		COAL (DIRTY)		12.09													
					9												
13		INTERLAMINATED SANDSTONE/SILTSTONE															
14				162.24	10												
				14.29													
	Appley Bamboo Building 86 Rock Coal	INTERBEDDED SILTSTONE/MUDSTONE															
15																	
					11												
				160.60													
16		MUDSTONE		12.93													
				160.18													
		SILTSTONE TO MUDSTONE		14.37													
				159.72													
17		INTERLAMINATED SANDSTONE/SILTSTONE		14.83													
				159.21													
		COAL		15.34	12												
				158.97													
				17.58													
18		INTERLAMINATED SANDSTONE/SILTSTONE															
19					13												
				157.27													
		COAL															
		MUDSTONE		19.89													
				156.99													
		INTERBEDDED MUDSTONE/SILTSTONE		19.96													
20		CONTINUED ON SHEET 3															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN S.D.
DATE MAR. 6, 1985 CHECKED J.C.

RECORD OF BOREHOLE S.C.-4

SHEET 3 OF 5

LOCATION: TUNNEL 2, CH. 681.38 — BORING DATE AUG. 4, 1984 — DATUM

INCLINATION 90° / AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	MACHINE HOLE: FREQ. PER 0.3m	DISCONTINUITY DATA: CLOSE JOINT	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec.	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
20		CONTINUED FROM SHEET 2															
21		INTERBEDDED MUDSTONE / SILTSTONE			14	NA a.c.											
22					15												
				153.90 22.45													
23		MUDSTONE BROWN CLASTS		153.47 21.08													
		CARBONACEOUS MUDSTONE		153.31 21.54													
		MUDSTONE		152.75 23.80	16												
24		INTERLAIN SILTSTONE / SANDSTONE		152.38 24.17													
		SILTSTONE		151.81 24.74													
25		SILTSTONE GRADING TO MUDSTONE			17												
				150.87 25.68													
26		INTERBEDDED SILTSTONE / MUDSTONE			18												
27																	
28					19												
				147.84 28.71													
29		SILTSTONE		147.14 29.41	20												
		INTERLAMINATED SILTSTONE / MUDSTONE															
30		CONTINUED ON SHEET 4															

ROTARY DIAMOND DRILLING 86 mm. Rock core.

DEPTH SCALE (ALONG HOLE) 1:50 METRIC

ROCK LOGGED S.L. DRAWN S.G.

DATE MAR. 6, 1985 CHECKED J.V.

RECORD OF BOREHOLE S.C.-4

SHEET 4 OF 5

LOCATION: TUNNEL 2, CH. 1981.38 — BORING DATE AUG. 4, 1984 — DATUM

INCLINATION 90° ↓ AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — WL)	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec.	ADDITIONAL TESTING	WATER LEVELS AND NOTES	INSTRUMENTATION
30	Rotary Diamond Drilling & Rock Core	CONTINUED FROM SHEET 3																
		INTERLAMINATED SANDSTONE / SILTSTONE		-146.03		BX												
				30.52		B.C.												
31		INTERBEDDED SILTSTONE / MUDSTONE			21													
				-145														
32					22													
33				-143.21														
				33.34														
34		SILTSTONE, LENSES OF BUFF LIGHT GREY COLOURED MATERIAL, COARSER GRAINED SANDY MATERIAL, SILTY LAMINATIONS NEAR TOP OF UNIT			23													
				-141.64														
35		FINE TO MEDIUM GRAINED SANDSTONE		34.89														
				-141.11														
		CONGLOMERITIC SANDSTONE, TYPE III AND II CLASTS		35.42														
				-140.91														
		LISTRIC SURFACES MUDSTONE		35.64	24													
36				-140.44														
		TYPE II TO TYPE III		36.11														
				-140.16														
		SANDSTONE WITH SILTSTONE CLASTS		36.39														
37				-139.51														
		GRADATION TO INTERBEDDED SANDSTONE / SILTSTONE		37.04	25													
				-138.81														
38				37.74														
		SILTSTONE			26													
39																		
					27													
40		CONTINUED ON SHEET 5																

DEPTH SCALE (ALONG HOLE) 1:90 METRIC

ROCK LOGGED S.L. DRAWN D.M.

DATE MAR. 6, 1985 CHECKED J.G.

RECORD OF BOREHOLE S.C-4

SHEET 5 OF 5

LOCATION TUNNEL 2, CH. 1881.38 — BORING DATE AUG. 4, 1984 — DATUM

INCLINATION 90° ↓ AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3m	WATER CONTENT, % (Wp — o — Wl)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP OF CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING	WATER LEVELS AND NOTES	INSTRUMENTATION
40	Extra Diamond Drilling 86 Rock Core	CONTINUED FROM SHEET 4 SILTSTONE		-136.10 40.13														
		SANDSTONE CONTAINING SILTSTONE CLASTS (GREY AND BUFF COLOURED)		-135.89	27	SS. R.C.												
		SILTY SANDSTONE		40.64 -135.59														
41		SILTSTONE		40.96														
					28													
42				-134.99														
		CARBONACEOUS MUDSTONE		42.16 -134.04														
		SILTSTONE		42.49														
43					29													
				-133.06														
		INTERLAMINATED SANDSTONE / SILTSTONE		43.49														
44																		
					30													
45																		
				-130.99														
		SILTSTONE		43.56 -130.81														
				43.74														
46		MUDSTONE SHALEY SECTIONS			31													
47				-129.45														
		CARBONACEOUS MUDSTONE, FOSSILIFEROUS ON PARTINGS		47.07 -129.05														
		APPROXIMATELY 1 m. DIRTY COAL, STONEY, FLAKES OF $CaCo_3$ ON PARTINGS PHALEN SEAM		47.50	32													
48				-127.95														
		END OF HOLE		48.40														
49																		
50																		

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN S.B.
DATE MAR. 7, 1988 CHECKED J.G.

TUNNEL NO. 3 - BOREHOLE LOGS

June 1985

831-6014

RECORD OF BOREHOLE 3T 800EB

SHEET 1 OF 4

LOCATION Tunnel No. at 800m

BORING DATE AUGUST 2,3, 1983

DATUM GEODETIC

INCLINATION 15° WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

PROJECT 81-601M

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — Wl)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, K, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
0	ROTARY DIAMOND DRILLING NQ ROCK CORE	WEST SIDE WALL TUNNEL No. 3		0.00													
		FRESH, THICKLY TO VERY THICKLY BEDDED MED. GREY, FINE TO MED. GRAINED SANDSTONE WITH MINOR CARBONACEOUS LAMINATIONS			1	NB 2.0								R.-FL.			
1														R.-FL.			
														FL.			
2		MED. GRAINED SANDSTONE WITH ROUNDED KAOLINITE GRAINS 2-3 mm IN DIA.												FL., Sm			
														FL., Sm			
3														FL., Sm			
					2												
4																	
5																	
6														Sm-R., FL.			
														Sm., FL.			
														R. CARB. FILLED			
					3									BROKEN CORE			
7														CARB. FILLED FRACTURE PYRITIC			
														Sm, CARB. FILLED PYRITIC			
8																	
														CARB. FILLED, PYR.			
9																	
					4												
10																	
11																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. GRAPH S.P.
DATE MAY 24 1985 CHECKED CJ

FORM: GA-D-24 REVISED TO GA-TS-07 GENERAL SOIL

RECORD OF BOREHOLE 3T 800EB

SHEET 2 OF 4

LOCATION Tunnel No. 3 CN 800 m

BORING DATE AUGUST 2,3,1988

DATUM GEODETIC

INCLINATION 15° AZIMUTH

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

PROJECT 88-G-202

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp, W, WL)	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP TO AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
11	ROTARY DIAMOND DRILLING NQ ROCK CORE	FRESH, FINE GRAINED, VERY THICKLY BEDDED DARK GREY SANDSTONE WITH ABUNDANCE OF CARBONACEOUS MATERIAL			4												
12																	
13					5												
14																	
15																	
16					6												
17																	
18																	
19					7												
20																	
21																	
22					8												

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN S.P.
DATE MAY 24,1989 CHECKED

RECORD OF BOREHOLE 3T 800EB

SHEET 3 OF 4

LOCATION TUNNEL NO. 3 CH. 800m

INCLINATION 15° WEST SIDE WALL

BORING DATE AUGUST 2, 3, 1965

DATUM GEODETIC

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

PROJECT 631-9214

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING: WATER LEVELS AND HOLES	INSTRUMENTATION
22															
23		FRESH, FINE GRAINED VERY THICKLY BEDDED DARK GRAY SANDSTONE WITH CARBONACEOUS MATERIAL			8	SPL. S.C.									
24															
25					9										
26															
27	ROTARY DIAMOND DRILLING NQ ROCK CORE														
28					10										
29															
30															
31															
32					11										
33															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN G.P.

DATE MAY 24, 1966 CHECKED S.L.

FORM: GA-D-14 REVISED TO 65% OF ORIGINAL SIZE

RECORD OF BOREHOLE 3T 800 EB

SHEET 4 OF 4

LOCATION Tunnel No. 3 Ch. 800 m

BORING DATE AUGUST 2, 3, 1983

DATUM GEODETIC

INCLINATION 15° WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3m	WATER CONTENT, % (wP, w, wL)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	RQD, %	DISCONTINUITY DATA: FRACTURE INDEX, per 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
33	ROTARY DIAMOND DRILLING NQ ROCK CORE																
34		FELSIC, FINE GRAINED VERY THICKLY BEDDED DARK GREY SANDSTONE WITH CARBONACEOUS MATERIAL			12	NQ R.C.											
35																	
36																	
37					13	"											
38																	
39																	
40																	
41					14	"											
42																	
43																	
44		END OF HOLE		43.31													

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN G.P.

DATE MAY 24, 1988 CHECKED

RECORD OF BOREHOLE 3T 804

SHEET 1 OF 8

LOCATION TUNNEL No. 3 Ch 804 m

BORING DATE DEC. 18-19, 1984 DATUM

INCLINATION HORIZONTAL WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP WITH RESPECT TO C.A.	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
0	ROTARY DIAMOND DRILLING N.X. ROCK CORE	GROUND SURFACE		0.0													
		FRESH, MEDIUM GREY MODERATELY TO THICKLY BEDDED, FINE TO MEDIUM GRAINED SANDSTONE WITH MIC. CALCAREOUS COATING ON FRACTURES			1	MS L.S.								RE, PL RE, PL PL, CALCAREOUS COATING PL, 3m			
4		MEDIUM TO COARSE GRAINED SANDSTONE WITH ABUNDANT CLAY AND SILTSTONE GRAINS		3.96	4												
6		FINE GRAINED SANDSTONE WITH SILTSTONE INTERBEDS		5.49	5												
7		FINE GRAINED SILTY SANDSTONE		7.01	6												
8														PL, RE, SLIGHTLY CALCAREOUS			
9					7												
10		CONTINUED ON SHEET 2															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED N.H. DRAWN G.P.

DATE MAY 22, 1988 CHECKED —

RECORD OF BOREHOLE 3T 804

SHEET 2 OF 3

LOCATION Tunnel no 3 CH 804 m

BORING DATE DEC. 18-19, 1985

DATUM

INCLINATION HORIZONTAL WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, %	RECOVERY TOTAL CORE, %	RECOVERY SOLID CORE, %	R.Q.D. %	DISCONTINUITY DATA FRACTURES PER 0.3m	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY k, cm/sec	ADDITIONAL TESTING	INSTRUMENTATION
10		CONTINUED FROM SHEET 1		10.0												
11	ROTARY DIAMOND DRILLING NQ Rock core	FINE GRAINED SILTY SANDSTONE			8	R.C.										
12					9								PL, UE			
13																
14					10								PL, UE			
15																
16					11								PL (Possibly)			
17																
18					12											
19					13								PL UE PL UE			
20		CONTINUED ON SHEET 3			14											

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED M.H. DRAWN G.P.

DATE MAY 22, 1986 CHECKED

RECORD OF BOREHOLE 3T 804

SHEET 3 OF 5

LOCATION Tunnel no. 3 CH 804 m

BORING DATE DEC. 18-19, 1984 DATUM

INCLINATION HORIZONTAL WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

PROJECT 831-5914

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, %	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACTURE INDEX per 0.3m	DISCONTINUITY DATA DIP	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING WATER LEVELS AND NOTES	INSTRUMENTATION
20	Rotary diamond drilling NQ Rock core	CONTINUED FROM SHEET 2		20.0	14	RC											
		Fine Grained Silty Sandstone												PL, NE			
21					15												
22														PL, NE			
23					16												
24																	
25					17												
26					18												
27																	
28					19												
29					20												
30		CONTINUED ON SHEET 4			21												

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED N.H. DRAWN S.P.
DATE MAY 22, 1985 CHECKED

FORM GA-D-14 (SEE REVERSE SIDE FOR GENERAL NOTES)

RECORD OF BOREHOLE 3T 804

SHEET 4 OF 5

LOCATION Tunnel No. 3 CH 804 m

INCLINATION Horizontal West side wall

BORING DATE DEC. 18-19, 1985

DATUM

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

PROJECT 81-03

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3m	WATER CONTENT, % (w_P — w — w_L)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIPP (WITH CORE AXIS)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec.	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
30	Rotary Diamond Drilling NX Rock Core	CONTINUED FROM SHEET 3															
31		FINE GRAINED SILTY SANDSTONE			21												
32					22												
33																	
34					23												
35																	
36					24												
37					25												
38					26												
39																	
40		CONTINUED ON SHEET 5			27												

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED M.H. DRAWN G.P.
DATE MAY 22, 1986 CHECKED cj

FORM GA-B-14 REVISED TO GO ON ORIGINAL 1982 (SEDGE 2000)

RECORD OF BOREHOLE 3T 804

SHEET 5 OF 5

LOCATION Tunnel no. 2 Ch 804 m

BORING DATE DEC. 18-19, 1985

DATUM

INCLINATION HORIZONTAL WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

PROJECT 831-804

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING / WATER LEVELS AND NOTES	INSTRUMENTATION
40	Rotary diamond drilling with casing	CONTINUED FROM SHEET 4															
					27	NR								FL, VR			
		FINE GRAINED SANDSTONE, LESS SILTY															
41					28												
42		END OF HOLE		41.94													

DEPTH SCALE (ALONG HOLE)
1:90 METRIC

ROCK LOGGED NH DRAWN SP

DATE MAY 22, 1986 CHECKED [illegible]

FORM: KA-9-84 REDUCED TO 50 % OF ORIGINAL SIZE (ISSUED 1986)

RECORD OF BOREHOLE 3T 900EB

SHEET 1 OF 4

LOCATION Tunnel no. 3 c.h 900 m — BORING DATE AUGUST 4,5, 1988 — DATUM GEODETIC

INCLINATION 18° — WEST SIDE WALL — SAMPLER / PENETRATION TEST HAMMER WEIGHT —— — DROP ——

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	INVERSE OF HYDRAULIC CONDUCTIVITY	POSITION TESTING: WATER LEVELS AND LOSS	INSTRUMENTATION
0		WEST SIDE WALL TUNNEL no. 3		0.00											
1	ROTARY DIAMOND DRILLING NQ ROCK CORE	FRESH, MED. TO THICKLY BEDDED, LIGHT TO MED. GREY, FINE TO MED. GRAINED SANDSTONE WITH THIN COARSER GRAINED MUDSTONE CONGLOMERATE UNITS. CARBONACEOUS LAMINATIONS THROUGHOUT			1	C.R. F.R.						Pl. Sm Pl. Sm. Pl., Carbonaceous coating Stepped Cont. Carbonaceous coating Pl., Carbonaceous coating. Un. Pl.			
2															
3															
4															
5					2	C									
6															
7												Un.			
8															
9					3	C						Sm. Pl.			
10															
11															

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN G.P.
DATE MAY 23, 1988 CHECKED

RECORD OF BOREHOLE 3T 900 EB

SHEET 2 OF 4

LOCATION Tunnel No. 3 CH 900 m

BORING DATE AUGUST 4,5, 1988

DATUM GEODETIC

INCLINATION 18° WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH (METRES)	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	DISCONTINUITY DATA: SPACING (mm)	DISCONTINUITY DATA: DIP	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec.	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
11	ROTARY DIAMOND DRILLING NQ ROCK CORE			11.8													
12		MUDSTONE CONGLOMERATE - CLASTS 2 - 100 mm. DIA. RANDOMLY DISTRIBUTED WITH MINOR COAL LAMINATIONS 0.5 - 0.25 mm IN WIDTH.			3												
13				13.15													
14		FRESH, THICKLY BEDDED LIGHT TO MED. GRAY, FINE TO MED. GRAINED SANDSTONE			4												
15																	
16														45			
17					5									Pl., Sm			
18														Pl., Sm			
19														Pl., sl.			
20														Pl., Sm			
21					6									Pl., Sm.			
22																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED ____ DRAWN S.P.

DATE MAY 23, 1989 CHECKED ____

RECORD OF BOREHOLE 3T 900 EB

SHEET 3 OF 4

LOCATION Tunnel No. 2 Ch 900 m

BORING DATE AUGUST 5, 6, 1985

DATUM GEODETIC

INCLINATION 15° WEST SIDE HILL

SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP —

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
22	ROTARY DIAMOND DRILLING NQ ROCK CORE																
23					7	SPT R.C.								R. FL.			
24		MUDSTONE CONGLOMERATE - CLASTS UP TO 50 mm DIA.		23.97 24.00													
25																	
26		FRESH, THICKLY BEDDED LIGHT TO MED. GREY FINE TO MEDIUM GRAINED SANDSTONE			8	"											
27																	
28																	
29					9	"											
30																	
31														R. FL.			
32					10									R. FL.			
33																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN S.P.

DATE MAY 21, 1989 CHECKED CG

RECORD OF BOREHOLE 3T 900EB

SHEET 4 OF 4

LOCATION Tunnel No. 3 CH. 900 m — BORING DATE AUGUST 5, 6, 1985 — DATUM GEODETIC

INCLINATION 1.5° WEST SIDE WALL — SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX, per 0.3m	DISCONTINUITY DATA: DIP	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	PERMEABILITY: CONDUCTIVITY	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
33	ROTARY DIAMOND DRILLING NQ ROCK CORE	FRESH, THICKLY BEDDED LIGHT TO MED. GREY. FINE TO MEDIUM GRAINED SANDSTONE.			10	SA, RC											
34																	
35					11												
36																	
37														Polished Slickensided			
38					12												
39																	
40																	
41																	
42					13												
43																	
44		END OF HOLE		43.39													

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED SL. DRAWN GP
DATE MAY 24, 1988 CHECKED

RECORD OF BOREHOLE 3T 1025EA

SHEET 1 OF 3

LOCATION Tunnel no. 3 Ch 1025m

BORING DATE AUGUST 11, 1983

DATUM GEODETIC

INCLINATION 90° ↓

SAMPLER / PENETRATION TEST HAMMER WEIGHT ——— DROP ———

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, %	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA DIP°	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING WATER LEVELS AND NOTES	INSTRUMENTATION
0				0.00										S, SH, FL to VC			
	ROTARY STANDARD DRILLING NQ ROCK CORE	FRESH, MEDIUM TO THICKLY BEDDED, GREY, FINE TO COARSE GRAINED SANDSTONE WITH DARK GREY CARBONACEOUS LAMINATIONS			1	96 % C.								FL, CARBONACEOUS LAMINATIONS (CARB)			
1														VS, CARB			
														MS, CARB			
2		SANDSTONE, COAL/CONGLOMERATE BANDS 10-40 mm DIA. ABR. TO COARSE GRAINED SANDS WITH [illegible]		1.92										GS, CARB			
				2.21										FL, CARB.			
		FRESH, MEDIUM TO THICKLY BEDDED, GREY, FINE TO COARSE GRAINED SANDSTONE WITH DARK GREY CARBONACEOUS LAMINATIONS			2									FL, CARB			
3														FL, CARB.			
					3									FL, CARB.			
4																	
					4												
5																	
														SM, FL, CARB.			
6					5									SM, FL, CARB			
														CARB.			
7														FL, CARB.			
				7.99										FL, CARB			
8		FRESH, MEDIUM BEDDED MEDIUM TO DARK GREY SANDSTONE AND FINE GRAINED SANDSTONE INTERLAMINATIONS			6									FL, CARB.			
														FL, CARB.			
9														SM, FL, CARB.			
					7									SM, FL, CARB.			
10														SM, FL, CARB.			
														SM, FL, CARB.			
														SM, FL, CARB.			
11					8									SM, FL, CARB.			

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED B.L. DRAWN G.D.
DATE MAY 23, 1984 CHECKED [illegible]

PROJECT 83-1025

FORM GA-8-14 REVISED TO 1% OF ORIGINAL SIZE

RECORD OF BOREHOLE 3T 1025 EA

SHEET 2 OF 3

LOCATION Tunnel No. 3 CH 1025 m

INCLINATION 90° ↓

BORING DATE AUGUST 11, 1985

DATUM GEODETIC

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

PROJECT 31-504

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, % Wp — W — Wl	RECOVERY TOTAL CORE, %	RECOVERY SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, per 0.3m	DISCONTINUITY DATA DIP	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING WATER LEVELS AND NOTES	INSTRUMENTATION
11					8	SS, B.C.								Sm, Pl, Cas			
														Sm, Pl, Cas			
12		FRESH, THICKLY BEDDED DARK GRAY SILTSTONE CONTAINING CARBONACEOUS LAMINATIONS		0.76													
					9												
13				12.83													
		INTERBEDDED SANDSTONE AND SILTSTONE UNITS WITH FREQUENT CARBONACEOUS PARTINGS												Sm, Pl, Cas			
14					10									Sm, Pl, Cas			
														Sm, Pl, Cas			
15														Sm, Pl, Cas			
					11									Sm, Pl, Cas			
16														Sm, Pl, Cas			
														Sm, Pl, Cas			
17					12									Sm, Pl, Cas			
														Sm, Pl, Cas			
18														Sm, Pl, Cas			
														Sm, Pl, Cas			
19					13									Sm, Pl, Cas			
														Sm, Pl, Cas			
20														Sm, Pl, Cas			
														Sm, Pl, Cas			
21					14									Sm			
22		FRESH, MED. TO THICKLY BEDDED DARK GRAY SILTSTONE		21.32													

ROTARY DIAMOND DRILLING
76 mm ROCK CORE

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED SL. DRAWN S.P.

DATE MAY 23, 1986 CHECKED GJ

RECORD OF BOREHOLE 3T 1025EA

SHEET 3 OF 3

LOCATION TUNNEL No. 3 CH 1025 m — BORING DATE AUGUST 11, 1965 — DATUM GEODETIC

INCLINATION 90° — SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3 m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
22					14										
		END OF HOLE		22.26											
23															
24															

DEPTH SCALE (ALONG HOLE)
1:90 METRIC

ROCK LOGGED S.L. GRAPH G.P.
DATE MAY 23, 1968 CHECKED

RECORD OF BOREHOLE 3T 1025EB

SHEET 1 OF 3

LOCATION Tunnel No. 3 CH 1025m

INCLINATION HORIZONTAL WEST SIDE WALL

BORING DATE AUGUST 9, 1983

DATUM GEODETIC

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	WATER CONTENT, %	RECOVERY TOTAL CORE, %	RECOVERY SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA DIP	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING / WATER LEVELS AND NOTES	INSTRUMENTATION
0	ROTARY DIAMOND DRILLING BQ ROCK CORE	FRESH, THICK TO VERY THICKLY BEDDED FINE GRAINED, MED. GREY SANDSTONE CONTAINING CARBONACEOUS LAMINATIONS			1	RC								UR R, Sm, PL PL, Sm PL, vE			
1																	
2				-1.98 2.06	2												
		MUDSTONE CLASTS 35 mm DIA GRADUALLY CHANGING TO FINE TO MED. GRAINED SANDSTONE		2.32													
3					3												
		MUDSTONE AND CARBONACEOUS CLASTS IN MED. GRAINED SANDY MATRIX. — CLASTS AVE. 10 - 20 mm. (BOTH ROUNDED AND ELONGATED)															
4					4												
5																	
6		FRESH, THICKLY BEDDED, FINE GRAINED SANDSTONE		5.90	5									Sm, PL			
7					6									Sm, PL			
8														Sm, dE			
		MUDSTONE CLASTS (10 mm SIZE) AND WAVY CARBONACEOUS LAMINATIONS IN MED. GRAINED SANDY MATRIX.		8.33										Sm, Pyrite			
9					7												
10																	
11					8												

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED JL DRAWN S.F.
DATE MAY 24, 1985 CHECKED

RECORD OF BOREHOLE 3T 1025EB

SHEET 2 OF 3

LOCATION Tunnel No. 3 CH 1025m — BORING DATE AUGUST 9, 1953 — DATUM

INCLINATION HORIZONTAL WEST SIDE WALL — SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — WL)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	DISCONTINUITY DATA: FRACTURES PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	PERMEABILITY: k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
11	ROTARY DIAMOND DRILLING BQ ROCK CORE				8												
				11.39													
12		FRESH, VERY THICKLY BEDDED FINE GRAINED MED. GREY SANDSTONE			9	SA C.A.											
13					10												
14																	
15					11												
16																	
17					12												
18					13												
19				19.46													
		SANDSTONE CONTAINING MORE CARBONACEOUS MATERIAL IN PODS			14												
20																	
				20.57													
21		SANDSTONE BECOMING DARK GREY WITH WAVY CARBONACEOUS LAMINATIONS			15												
22																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN S.P.
DATE MAY 24, 1955 CHECKED

RECORD OF BOREHOLE 3T 1025EB

SHEET 3 OF 3

LOCATION Tunnel No. 3 CH 1+25 m

BORING DATE AUGUST 9, 1983

DATUM GEODETIC

INCLINATION HORIZONTAL WEST SIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP & DIP DIRECTION	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, K, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
22																	
		SANDSTONE BECOMING DARK GREY WITH CARBONACEOUS LAMINATIONS			4	CB	60										
		END OF HOLE		22.7													
23																	
24																	

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN S.P.
DATE MAY 24, 1985 CHECKED

RECORD OF BOREHOLE 3T 1025 EC

SHEET 1 OF 3

LOCATION Tunnel No. 3 CH 1025 m

BORING DATE AUG. 8, 1988

DATUM GEODETIC

INCLINATION HORIZONTAL EASTSIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT ——— DROP ———

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP (degrees)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING	WATER LEVELS AND NOTES	INSTRUMENTATION
0	ROTARY DIAMOND DRILLING 76 mm ROCK CORE	FRESH, THICKLY TO VERY THICKLY BEDDED, FINE TO MED. GRAINED, LIGHT TO MED. GREY SANDSTONE CONTAINING CARBONACEOUS AND COAL LENSES		0.00	1	BA, RA								Sm. C. PL., Sm. R. PL.				
1		MUDSTONE CONGLOMERATE CLASTS 5-30 mm LONG IN MED. GRAINED SANDY MATRIX.		0.62	2									PL., PYRITE COATING				
2																		
3		FRESH, THICKLY TO VERY THICKLY BEDDED, FINE TO MEDIUM GRAINED LIGHT TO MED. GREY SANDSTONE CONTAINING CARBONACEOUS LAMINATIONS AND COAL LENSES 3 - 5 mm WIDE COAL BANDS AND PYRITE LAYERS BETWEEN 3.84 - 4.10 m		2.20	3													
4					4									COAL AND PYRITE BAND, VE				
5																		
6		MUDSTONE CONGLOMERATE CONTAINING PYRITE LENSES CLASTS 15 mm LONG		5.93	5									Sm, PL. CARBONACEOUS COATING				
7		FRESH, THICKLY TO VERY THICKLY BEDDED, FINE TO MEDIUM GRAINED LIGHT TO MED. GREY SANDSTONE CONTAINING CARBONACEOUS LAMINATIONS AND COAL LENSES		6.91	6													
8					7													
9																		
10					8													
11																		

DEPTH SCALE (ALONG HOLE)
1:50 METRIC

ROCK LOGGED S.L. DRAWN S.D.
DATE MAY 24, 1989 CHECKED

RECORD OF BOREHOLE 3T 1025 EC

SHEET 2 OF 3

LOCATION Tunnel no. 3 CH 1025 m

BORING DATE AUG. 8, 1988

DATUM GEODETIC

INCLINATION HORIZONTAL EASTSIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3 m	WATER CONTENT, % (Wp — W — Wl)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3 m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
11	ROTARY DIAMOND DRILLING B.Q. ROCK CORE	FRESH, THICKLY TO VERY THICKLY BEDDED, FINE TO MEDIUM GRAINED LIGHT TO MED. GREY SANDSTONE CONTAINING CARBONACEOUS LAMINATIONS AND COAL LENSES			8												
12						SA											
13					9												
14														Sm, PL			
15					10									Sm, PL			
16														Sm, PL			
17					12												
18																	
19					13												
20																	
21		MUDSTONE CONGLOMERATE CONTAINING SOFT BUFF COLOURED CLAY MINERAL CLASTS - BLOCKS UNDER MAX. 4cm	CONGLOM	21.10	18									U.B.			
22				21.78													

DEPTH SCALE (ALONG HOLE)
1:50

ROCK LOGGED G.L. DRAWN G.B.
DATE MAY 25, 1989 CHECKED

RECORD OF BOREHOLE 3T 1025 EC

SHEET 3 OF 3

LOCATION TUNNEL No. 3 CH 1025 m

BORING DATE AUG. 8, 1983

DATUM GEODETIC

INCLINATION HORIZONTAL EASTSIDE WALL

SAMPLER / PENETRATION TEST HAMMER WEIGHT

DROP

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (W_P, W, W_L)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX, PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
22					3												
		END OF HOLE		22.24													
23																	
24																	

DEPTH SCALE (ALONG HOLE)

1:50

ROCK LOGGED S.L. DRAWN S.B.

DATE MAY 24, 1985 CHECKED

RECORD OF BOREHOLE 3T 1025 ED

SHEET 1 OF 3

LOCATION Tunnel No. 3 CH 1025 m — BORING DATE AUG. 12, 1988 — DATUM GEODETIC

INCLINATION 90° Down — SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA: DIPS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
0	ROTARY DIAMOND DRILLING; 8.6 INCH CASE	FRESH, THINLY BEDDED DARK GREY MUDSTONE WITH FREQUENT FRACTURES		0.00	1	SC								Sm,R, Pl, VE			
1					2	"								VE, Sm-R, Pl			
2					3	"								VE, Sm-R, Pl			
3		FRESH, FRACTURED TO BROKEN DARK GREY TO BLACK CARBONACEOUS MUDSTONE		3.08													
				3.66	4	"								VE, Sm-R, Pl			
4		FRESH, THINLY BEDDED DARK GREY MUDSTONE												Sm, Pl			
5					5	"								Sm, Pl			
6				5.85										Sm, Pl, CARBONACEOUS LAMINAE			
7		FRESH, THINLY BEDDED MUDSTONE CONTAINING SILTY LAMINATIONS WITH CARBONACEOUS LENSES			6	"								VE, R,			
8														R,			
9					7	"								Sm-VE, R, (broken)			
10														Sm, R, CARBONACEOUS LAMINAE			
11					8	"								VE, R,			
														R,			

DEPTH SCALE (ALONG HOLE) 1:50

ROCK LOGGED S.L. DRAWN S.D.

DATE MAY 24, 1989 CHECKED

RECORD OF BOREHOLE 3T 1025 ED

SHEET 2 OF 3

LOCATION Tunnel no. 3 CH 1045 m

INCLINATION 90° DOWN

BORING DATE AUG. 12, 1988

DATUM GEODETIC

SAMPLER / PENETRATION TEST HAMMER WEIGHT —— DROP ——

DEPTH METRES	DRILLING RECORD	DESCRIPTION	STRATIGRAPHIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (w_P, w, w_L)	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX, FI per 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, K, cm/sec	ADDITIONAL TESTING: WATER LEVELS AND HEAD	INSTRUMENTATION
11																	
		CARBONACEOUS MUDSTONE, BROKEN UP MUCH LIGHTER COLOURED		11.80													
12	ROTARY DIAMOND DRILLING & NQ ROCK CORE	FRESH, MED. TO THICKLY BEDDED DARK GREY MUDSTONE		12.48	9	SS SA								PL, CARBONACEOUS, CARBONIZED (LEAF) LAMINA, SURFACE; VB, CARB., SM-PL; VB, CARB., SM-PL; R, VB, CARB., LIGHT-PL. SURFACE			
13		INTERLAMINATED SILTSTONE AND MUDSTONE GRADING CHANGES SHARPLY TO FINE GRAINED SANDSTONE AT ABOUT 13.70 MBFH		13.70	10	"								VB, SLIGHTLY LIGHT-PL.; VB, SLIGHTLY LIGHT-PL.; SM, PL. SLIGHTLY LIGHT-PL.; SM, PL.			
14		FRESH, THICKLY TO VERY THICKLY BEDDED, GREY SANDSTONE, ALTERNATING FINE AND MEDIUM GRAINED INTERBEDS CONTAINING FREQUENT CARBONACEOUS GRAINS		13.88	11	"								PL., VB.			
15																	
16					12	"											
17														R, SM., PL.			
		MUDSTONE CONGLOMERATE to SANDY MATRIX CLASTS - ELONGATED 2cm - 4cm LONG 80°-90° W.R.T. CORE AXIS		17.18	13	"											
18		FRESH, THICKLY TO VERY THICKLY BEDDED GREY SANDSTONE, ALTERNATING FINE AND COARSE GRAINED INTERBEDS		17.44										SM., PL., CARB.			
19																	
					14	"								VB, R., CARB; R, SM., PL., CARB.; SM., PL., CARB.			
20																	
														PL, SM; R-SM, CARB			
					15	"											
21		FRESH, THICKLY BEDDED DARK GRAY MUDSTONE		20.43										VB			
					16	"								VB			
22														VB, LIGHT-			

DEPTH SCALE (ALONG HOLE)
1:50

ROCK LOGGED BA DRAWN GB

DATE NOV 24, 1988 CHECKED TG

RECORD OF BOREHOLE 3T 1025 ED

SHEET 3 OF 3

LOCATION Tunnel No. 3 at 1025 m

BORING DATE AUG. 18, 1988

DATUM GEODETIC

INCLINATION 90° Down

SAMPLER / PENETRATION TEST HAMMER WEIGHT ——— DROP ———

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — Wl)	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D. %	FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA: ANGLE TO CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/sec	ADDITIONAL TESTING	INSTRUMENTATION
22																	
					16	SS	0.0										
		End of Hole		22.94													
23																	
24																	

DEPTH SCALE (ALOOD HOLE)
1:50

ROCK LOGGED S.L. DRAWN S.B.

DATE MAY 24, 1989 CHECKED ———

APPENDIX B-2

STRESS MEASUREMENT REPORT

June 1985

831-6014

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

REPORT TO
CANMET ON

FIRST SERIES OF INSITU STRESS MEASUREMENTS IN THE DONKIN TUNNEL CAPE BRETON NOVA SCOTIA

Distribution:

1 copy - Canmet
Sydney, Nova Scotia

2 copies - Golder Associates
Mississauga, Ontario

October 1983

831-6014

ABSTRACT

The first series of insitu stress measurements for the tunnel research program at Donkin was completed in a 100 mm diameter drillhole located at chainage 964 m in tunnel no. 3. The insitu stresses were measured by the method of overcoring using the CSIRO Hollow Inclusion gauge and the USBM deformation gauge.

A total of five CSIRO tests and four USBM tests were completed. Of the five CSIRO tests, only the first two were considered valid due to the presence of a network of bubbles in the glue between the gauge and the wall of the pilot hole in the deeper tests. The primary cause of the bubbles is considered to be the result of slow groundwater seepage during curing of the glue. All the USBM tests were successful.

There is a distinct change in the deformation modulus along the length of the hole and the modulus values correlate reasonably well with the grain size of the rock material.

The results of the valid CSIRO and USBM tests are consistent. The average vertical stress measured at ch. 964 m is about 15 percent higher than the static vertical stress. The overall results indicate that the rock strata is under a moderately high insitu horizontal stress. The ratio of maximum horizontal to vertical insitu stresses is of the order of 2 to 3.

In view of the effect of groundwater seepage on the bonding of the CSIRO gauge, the methodology for the next series of stress measurements will have to be modified.

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1. INTRODUCTION

The Donkin-Morien Development Project in Cape Breton, Nova Scotia comprises two parallel mine access tunnels (Tunnels No. 2 and 3) extending 3.7 km offshore to intersect the Harbour Coal seam. Figure 1 shows the site location and the orientation of the tunnels. The rock through which the tunnels are being driven consists of an interbedded sequence of sandstones, siltstones, mudstones and coal seams dipping at approximately 7 to 8 degrees offshore.

Approximately 200 m of tunnel No. 2 has been completed to 4 m diameter at -20 percent grade using an experimental tunnel boring machine. Tunnel No. 3 has been driven by full face drill and blast methods to dimensions of 7.6 m wide by 5.3 m high (with uniradial arched back) at -20 percent grade to approximately chainage 780 m, then through a transition to a -10 percent grade to chainage 1027 m, the current face position. Currently (July 1983), the tunnelling operation at the site has stopped in preparation for the start-up of the TBM drivage in tunnel No. 2.

Golder Associates has been awarded a tunnel research contract under the auspices of CanMet through Supply and Services Canada. The primary objective of the research program is to study the various aspects of rock support interaction in the Donkin tunnels including insitu stress determinations.

The first series of insitu stress measurements was undertaken in tunnel No. 3 during May 1983. This report presents the techniques and the results of this series of measurements. It also forms the first of a series of reports to be prepared for the tunnel research program.

2. TEST LOCATIONS AND GEOLOGICAL CONDITION

The insitu stress measurements were carried out in a 100 mm diameter drillhole drilled at an azimuth of 105° and an upward inclination of 4° (normal to the tunnel axis) into the east sidewall of tunnel No. 3 at chainage 964 m. The depth of the hole and the positions of stress measurements in the hole are shown on Figure 2.

Tunnel No. 3 was mainly driven in a sandstone unit overlying the mixed sedimentary strata. The sandstone unit mainly comprises fresh to slightly weathered, laminated to thickly bedded, light grey, fine to coarse grained sandstone. Carbonaceous partings and cross beddings were often noted.

At the test site, the sandstone is generally thickly bedded, light to medium grey, fine to medium, subangular to subrounded grained with calcareous coatings of varying amount on most fractures. There is a fairly distinct change in grain size at approximately 10 m from the hole collar, being finer near the collar. The record of borehole log showing the core recovery, and the descriptions of the rock material and the discontinuities on the cores recovered from the stress measurement drillhole is attached to this report as Appendix A.

3. TEST PROCEDURE AND EQUIPMENT

3.1 General Test Procedure

In this test program, the insitu stresses were measured by the method of overcoring developed by the United States Bureau of Mines (Hooker and Bickel 1974). The techniques were slightly modified to suit the present program.

The general procedure of the overboring method is illustrated on Figure 3. A 100 mm diameter (H size) hole was drilled to about 250 mm short of the required location of the stress measurement test. A 38 mm diameter (EX size) pilot hole (approximately 600 mm in length) concentric with the 100 mm diameter hole was drilled through the test position. A stress measuring gauge was then installed in the pilot hole in an area free of joints or fractures, normally at 200 - 300 mm from the end of the 100 mm diameter hole. The pilot hole was then overcored using a 100 mm diameter thin-walled coring bit to relieve the stresses around the pilot hole. The corresponding changes in the strains or deformations in the pilot hole were monitored during overcoring using the stress measuring gauge connected to a digital strain indicator and a switch balance unit. The stresses were evaluated from the measured changes in the strains or deformations, and the deformation modulus determined by testing the overcored rock specimen.

Two types of stress measuring gauges were used in this series of stress measurement. They included the CSIRO triaxial hollow inclusion gauge (CSIRO gauge) and the USBM borehole deformation gauge (USBM gauge).

3.2 USBM Deformation Gauge

The USBM gauge (see Figure 4) is designed to measure the changes in the deformation of the pilot hole in three diameters (spaced 120° apart). The gauge has three pairs of buttons (see Figure 4) which provide contact between the surface of the borehole and the sensing element of the gauge. Continuous observation of the borehole deformation changes can be made during overcoring. This instrument enables the measurement of a two-dimensional stress field on a plane normal to the axis of the borehole. Details of this instrument has been described by Hooker and Bickel (1974). The calibration of the USBM gauge is presented in Appendix B.

3.3 CSIRO Triaxial "Hollow Inclusion" Gauge

The CSIRO gauge (see Figure 4) was developed by Worotnicki and Walton (1976) of the Australian Council of Scientific and Industrial Research Organization. This gauge follows the basic principle of the triaxial stress cell from CSIR South Africa (Leeman 1969). It consists of a thin-walled resin pipe in which three strain gauge rosettes (Figure 5) were encapsulated with a 12 core lead out cable attached.

When the gauge is cemented into the pilot hole, the strain gauges are at an average distance of 1.5 mm from the rock surface. Continuous monitoring of the strain reading is possible during the overcoring operation. The disposition of the strain gauges enables the determination of the three dimensional stress field around the borehole.

3.4 Biaxial Testing Equipment

The deformation modulus of the rock at the test position was determined using a "biaxial test cell", the set up of which is shown on Figure 6. The cell essentially consists

of a cylindrical steel jacket and seals. The overcored rock specimen recovered from the test position is tested in the cell with the USBM or the CSIRO gauge inside the specimen. Hydraulic oil is pumped into the space between the steel jack and the sealed membrane which is in contact with the overcore. The outer surface of the overcore is therefore subjected to a uniformly distributed radial (biaxial) pressure. During modulus testing, the deformations or strains of the inner hole of the overcore were monitored at various pressure increments and decrements. A summary of the test procedure and the calibration of the equipment are presented in Appendix C.

3.5 Installation Procedure of CSIRO "Hollow Inclusion" and USBM Gauge

The overcoring technique of stress measurement requires meticulous installation of borehole sensing instruments especially in the case of the CSIRO gauge where good bonding between the rock and the instrument is of critical importance. The procedure and equipment used for the installation of the CSIRO gauge and the USBM gauge are described in Appendix D.

3.6 Drilling Equipment

The stress measurement drillhole was drilled using a Longyear 38 underground drill supplied by the Cape Breton Development Corporation. The general arrangement and set up of the drill rig in the tunnel is shown on Figure 7.

Since drilling is the most expensive component of stress determination, a 100 mm diameter (H size) drillhole was used so that more readily available standard drilling equipment can be used. Apart from the standard HQ wireline equipment used for drilling the H size borehole, specialized ancillary drilling equipment was developed to facilitate the drilling of the

pilot hole and the overcoring operation. A list of the specialized drilling equipment and an outline of the procedure in using this equipment is given in Appendix E.

3.7 Certification of Testing Equipment

In compliance with the statutory requirements of the Coal Mines (CBDC) Safety Regulations, all electrical equipment (including their circuitries) used for stress measurements were inspected and certified by the Mining Research Laboratories of CanMet. This equipment was also inspected and approved by Labour Canada (Sydney) during the test program.

4. RESULTS OF TESTS

4.1 General

A total of five CSIRO tests and four USBM tests was undertaken during this series of stress measurement. The depths of the H holes, EX holes and the test positions are summarized in Table 1. The dimensions of the overcores recovered from the drillhole are also presented in the same Table. The results of the CSIRO, USBM and biaxial tests are presented in the following sections.

4.2 Results of CSIRO Tests

During the overcoring operation, strain readings of the nine strain gauges on the CSIRO gauges were continuously monitored and the results (strain readings) for the five CSIRO tests are plotted against the overcoring distance and are presented on Figures 8 to 12. In general, the strain readings were stable during the initial stage of overcoring. As the overcore bit approached the strain gauges, the strain readings started to change and became stable after the overcore bit had passed the gauge position. Based on Figures 8 to 12, the total changes in the readings of the strain gauges during the overcoring operation are summarized in Table 2 for each CSIRO test.

As a routine check on the effectiveness of the bonding of the CSIRO gauges, all the overcores recovered from the CSIRO tests were sectioned after completion of the biaxial tests. It was found that air bubbles had developed in the annulus of glue between the gauges and the wall of the pilot (EX) hole. For specimens cut from tests no. 1 and 2, (Figure 13), it was noted that the air bubbles were isolated and did not

occur at the strain gauge positions. The glue/rock interface appeared tight.

The density of bubbles however, was considerably higher in the specimens from tests no. 3, 4 and 5 (Figure 14) and there was evidence of inadequate bonding especially in test no. 5. It is also noted that the overcoring response curves and the corresponding changes in the strain readings were rather peculiar. This, coupled with the presence of the extensive network of air bubbles have led to the belief that the validity of the results from tests 3 to 5 are doubtful. Hence, only results from tests no. 1 and 2 were reduced in Section 4.5. Further discussion on the cause and effect of the bubbles in the glue is presented in Section 5.2.

4.3 Results of USBM Tests

In the USBM tests, the displacement of the pilot hole during overcoring was monitored. The displacements (as calculated from the strain readings using the calibration factors presented in Appendix B) for the three button positions are plotted against the overcoring distance and presented on Figures 15 to 18 respectively for USBM tests No. 1 to 4 Typically, the readings were stable during the initial stages and showed distinct changes when the overcore bit approached and subsequently passed the button positions. All the USBM test results displayed the classical response curves of good, successful tests. Minor drifting in button No. 3 occurred during test no. 2 but the overall results for the test can readily be interpreted based on the response curves of buttons no. 1 and 2. Based on Figures 15 to 18, the total diametral movements of the pilot hole at each button position are summarized in Table 3 for each USBM test.

4.4 Results of Biaxial Tests

Biaxial tests were carried out on overcores recovered from the CSIRO and USBM test positions. The test equipment and procedure have been described in Section 3.4. A total of eleven biaxial tests were performed including seven tests on dry and four tests on wet (sample soaked in distilled water for 24 hours prior to testing) samples. The schedule for the biaxial tests is presented in Table 4.

In view of the uncertainty in the bonding of the strain gauges and the abnormal response of the strain readings in CSIRO tests no. 3 to 5, it is only meaningful to consider results of biaxial tests on overcores from CSIRO tests no. 1 and 2, and from the USBM tests. Hence, only the results of nine biaxial tests were reported in Table 4. Figures 19 to 21 present the plots of the strain gauge readings in the CSIRO gauges with respect to the applied biaxial (radial pressure) pressures on the overcores from CSIRO tests no. 1 and 2. Figures 22 to 27 present results of biaxial tests using USBM gauge on overcores from the USBM tests 1 to 4 in which diameteral deformations of the pilot holes at the three button positions are plotted with respect to the applied biaxial pressures.

In general, the curves of strain/deformation vs. pressure are linear and show very little hystersis upon unloading. The biaxial test results also permit the anisotropy of the rock to be evaluated by comparing the three diametral displacements in the USBM tests and the three circumferential strains in the CSIRO tests. An additional indicator of anisotropy of the rock is given by comparing the observed strains at 45^{o} (ε_{45o}) to the core axis with the values of circumferential (ε_{cir}) and axial strains (ε_{ax}). In an isotropic material,

the following relationship holds.

$$\varepsilon_{45°} = 0.5\ (\varepsilon_{ax} + \varepsilon_{cir})$$

Based on the above comparison, the results shown on Figures 19 to 27 generally indicate that the deformation characteristics of the rock are isotropic.

4.5 Evaluation of Elastic Constants and Insitu Stresses

Evaluation of Elastic Constants

The deformation modulus and Poisson's ratio of the rock were evaluated based on the results of the biaxial tests. As the deformation behaviour was generally elastic and isotropic, the thick cylinder formula for plane stress condition was used in the analysis.

The elastic constants derived from the biaxial tests are summarized in Table 4. It can be noted that there is a distinct decrease in the deformation modulus beyond about 10 m from the hole collar. There is also a slight decrease (within 10 percent) in the deformation modulus when the sample is wet. As the drillhole was wet during overcoring, the modulus values from the wet samples were used in the evaluation of the insitu stresses.

Evaluation of Insitu Stresses

The evaluation of the insitu stresses from the overcoring tests was based on the strain data obtained during overcoring (see Table 2 and 3) and the rock deformation moduli and Poisson's ratios (see Table 4) obtained subsequent to overcoring. The reduction of the CSIRO test results was based on the expressions presented by Worotnicki and Walton (1976). The mathematical calculations were performed by computer

which included a statistical evaluation of the redundancy in the strain data. The reduction of the USBM test results was based on the formulae presented by Hooker and Bickel (1974). The magnitudes and directions of the principal stresses calculated from the CSIRO and USBM test data are summarized in Tables 5 and 6 respectively.

For comparison purposes, the principal stresses evaluated from the CSIRO tests and the USBM tests were resolved in the vertical direction (designated as the z direction) and in the horizontal plane along (x direction) and perpendicular (y direction) to the direction of the mine access tunnels as shown in Table 7.

5. DISCUSSION OF TEST RESULTS

5.1 Elastic Constants and Insitu Stresses

Elastic Constants

Based on the results of the biaxial tests presented in Section 4.3, it is apparent that there is a distinct change in the deformation modulus of the rock along the length of the drillhole.

Further investigation was undertaken to correlate the pattern of the change in the modulus value with the grain size of the rock. Figure 28 shows the grain size of samples of overcore from CSIRO test positions 2 and 3. These photographs were taken through the microscope under 70 times magnification. It may be noted that the samples from the low modulus material (CSIRO 3)are not as well cemented and have a definite intergranular porosity. Samples from other test positions were also examined under the microscope. The overall results of this investigation indicate that the modulus values from the biaxial tests correlate consistently with the grain size of the rock material. The finer grained sandstone has a modulus value substantially higher than the relatively more porous sandstone.

Insitu Stresses

According to the exposed geological conditions observed at the stress measurement drillhole location and the core recovered from the drillhole, the rock at the test site is generally homogeneous with the exception of a sharp change in the grain size at about 10 m from the hole collar. A few calcite filled joints were encountered but they were

all tight. By selection, there were no apparent fractures in the rock at the test positions. Hence, the test site at which the stresses were measured is typical of the general geological setting of the sandstone strata encountered along the excavated section of the mine access tunnel.

The resolved stress components in the horizontal and vertical planes relative to the tunnel axis are presented in Table 7. The following observations are noted from these results:

(a) The magnitudes of the stress components derived from the CSIRO tests are consistent with those from the USBM tests. Results of CSIRO 2 and USBM 2 (which are only 0.78 m apart) are in very good agreement.

(b) The horizontal stress component (σ_x) in the direction of the tunnel axis are lower close to the tunnel. The stress magnitudes increase and become fairly uniform further away. Similar trends of stress variation are noted in the vertical component (σ_z) and the component perpendicular (σ_y) to the tunnel axis. The average horizontal stress components close to and away from the tunnel are summarized below:

	Average Horizontal Stress (MPa)	
	σ_x	σ_y
Distance within 6 m of tunnel wall	3.6 (2 tests)	2.48 (1 test)
Distance between 6 m and 19 m from tunnel wall	7.93 (4 tests)	9.04 (1 test)

These results indicate that the tunnel excavation did in fact influence the stresses around the tunnel. The zone of major influence appears to extend to a distance of about one tunnel diameter from the tunnel wall. This is consistent with the theoretical stress influence zone around a circular tunnel.

(c) A comparison of the measured vertical stress and the static vertical stress (σ_v) was made and the results are summarized below:

(i) Average vertical stress (σ_z) = 4.9 MPa (standard deviation = 0.8 MPa) components from CSIRO 2, and USBM 2 to 4 (Table 7)

(ii) Static vertical stress (σ_v) calculated on the basis of the following parameters:

- tunnel chainage of test location = 964 m
- depth below sea level = 164.5 m
- depth of sea at ch. 964 m = 12 m
- density of rock = 2.7 M_g/m^3
- density of seawater = 1.025 M_g/m^3

Hence, vertical static stress (σ_v) = 4.2 MPa based on the weight of rock and water

It may be noted that the average measured vertical stress is about 15 percent higher than the static vertical stress. This is within the range of variations in the results of vertical stresses measured in Canada and in other parts of the world (Hoek and Brown, 1980).

(d) While the complete stress tensors were not measured in zones sufficiently far away from the tunnel excavation due to the problem with the bonding of the CSIRO gauges, the overall results do indicate that the rock strata at the test location is under a moderately high insitu horizontal stress. The ratio of maximum horizontal to vertical insitu stress is of the order of about 2 to 3.

5.2 Factors Affecting Results of Stress Measurement

During the insitu stress determination, it was observed that apart from careful installation, a number of other factors could have significant impact on the results of measurements.

These include:

(a) Bonding of the CSIRO gauge to the pilot hole.
(b) Temperature and humidity effects.
(c) Drilling.

Each of these factors and their effects are discussed in the following sections.

Bonding of the CSIRO Gauge to the Pilot Hole

Effective bonding of the CSIRO gauge to the rock is, among other factors, critical to the success of the CSIRO test. Prior to the CSIRO tests, the curing time of the glue was observed inside the tunnel and it was found that it required about 12 hours to fully cure the glue at an ambient temperature of about 8-10°C. This curing period was used to schedule the CSIRO and USBM tests in the test program.

After completion of the biaxial tests, the CSIRO tests were sectioned to examine the effectiveness of the bond between the CSIRO gauge and the rock. Bubbles were noted in the glue as described in Section 4. The procedure of installation was reviewed and it is believed that these bubbles were not the results of careless installation.

Further examination of these sectioned samples were carried out under the microscope. It was noted that the largest concentration of fine bubbles occurred in the zone which has the low modulus and a definite intergranular porosity. It is considered that the formation of these bubbles may be attributed to the following cause.

At the time of the test, the rock around the drillhole was saturated with water, but the permeability was sufficiently low that water was escaping extremely slowly from the rock mass. A measurement of the flow quantity made at the hole (after completion of all tests) over a 24 hr. period indicated that the discharge from the hole was about 0.36 litre/hour. This low flow situation accounted for the observation on site that very little water actually emanated from the drillhole and also accounted for the fact that swabbing of the

instrumented section of the drillhole with the cleaning tool had resulted in a complete clean-up of the rock and removal of the surrounding water.

After installation of the CSIRO gauge, water continued to seep from the individual pores into the very thin annulus of glue around the strain gauge tube and created the network of fine bubbles observed. Because the strain gauge cement does not harden for a number of hours after installation, the seepage of water as observed would be sufficient to cause the formation of the bubbles and in one case (CSIRO test no. 5), most of the glue was actually washed out of the hole. In the zones which did not exhibit this problem, there was either a lower intergranular porosity (finer grain) associated with a large amount of cementing material in the rock matrix or the permeability was very localized resulting in the formation of a few large bubbles rather than a network of small ones. Figure 30 shows the difference in the bond between the glue and the rock as observed under the microscope of the high and low modulus material. It may be noted that the contact at the interface of the glue and rock is tight in the case of the high modulus material while in the case of the low modulus material, the contact is not as complete.

In view of the effect of groundwater seepage on the bonding of the CSIRO gauge, the methodology to be used for the next set of stress determinations will have to be modified. One approach would be to do the measurements in the mudstone where the permeability is anticipated to be low. The potential problem is that the mudstone would be intrinsically weaker and more susceptible to degradation with time. The other approach would be to pressurize the hole with gas once the instrument is in place when the glue is curing. This would require some equipment development to achieve the desired

results. To augment the CSIRO tests, backup USBM tests would be carried out at selected positions in two other orthogonal holes to determine the three dimensionsal stress field.

Effects of Temperature and Humidity

The effect of temperature becomes significant when the difference between the drill water and the rock temperature is large such that the overcore response curves would be obscured by the strain changes due to thermal effects on the rock. Therefore, it is recommended practice to circulate drill water in the hole and to monitor the water temperature before and after overcoring. This procedure was adopted throughout the test program.

It was noted during the tests that drifting of the output occurred as a result of prolonged use of the readout instruments in the high humidity environment of the tunnel. This problem was discovered during one of the CSIRO tests when the drill water was being circulated prior to actual overcoring. Stablized readings could not be obtained. It was overcome by storing the readout instruments on surface and bringing them underground only when required to carry out overcoring tests. This minimized the exposure of the instruments to excessive moisture and alleviated the problem of drift in reading.

Drilling

The specialized drilling equipment for overcoring was built to ensure concentricity of the pilot and overcoring hole. During the initial stage of testing, it was noted that the coupling for the starter E core barrel was slightly off alignment. This caused eccentricity in the position of the

pilot hole and in turn created difficulties in the installation of the stress gauge. After the coupling was replaced, the pilot holes remained reasonably concentric.

In horizontal or subhorizontal drilling, especially in relatively deep holes as in the present case, there is a tendency for the drill string to rest on the invert of the hole due to gravitational effect. To compensate for this effect, the E core barrel was built as part of the attachment of the inner tube for the HQ barrel (see Appendix E) so that concentricity of the E and H hole could be maintained.

Due to the relatively soft nature of the sandstone, the vibration of the drilling string during overcoring at the deeper test positions was sufficient to result in overcored sections which are substantially smaller in diameter than the theoretical section (87.6 mm dia). While this did not affect the results of the measurement, the undersized overcores (see Table 1 for overcore dimensions) caused a number of rubber membranes to burst in the biaxial chamber, which was built to test cores within close tolerance of the theoretical section.

6. CONCLUSIONS

The first series of insitu stress determinations for the tunnel research project at Donkin was completed. A total of four USBM tests and five CSIRO tests were undertaken in a 100 mm diameter subhorizontal drillhole located at ch. 964 m in tunnel No. 3. The conclusions derived from this series of measurements are summarized below.

(a) Of the five CSIRO tests undertaken, only the first two tests were valid due to the formation of a network of air bubbles in the glue around the strain gauge tube in the deeper tests. The bubbles were likely caused by the slow seepage of groundwater during the curing of the glue. All USBM tests were successful.

(b) There is a distinct change in the deformation modulus of the rock along the length of the drillhole. The deformation modulus correlates reasonably well with the grain size and the intergranular matrix of the rock. On the basis of the examination made of the overcore under the microscope, it was found that the high modulus material is fine grained and is well cemented. The lower modulus material is coarser in grain, not as well cemented and has definite intergranular porosity. The modulus of wet samples is generally about 10 percent lower than that of the dry samples.

(c) Based on the results of biaxial tests on the overcores, the deformation characteristic of sandstone in which the stress measurements were undertaken is linear and isotropic within the range of stresses measured.

(d) The principal stresses obtained from the CSIRO tests and the USBM tests were resolved into vertical component (σ_z) and horizontal components in the directions parallel to (σ_x) and normal to (σ_y) the tunnel axis. The magnitudes of stress components derived from the CSIRO and USBM tests are consistent with each other. The tunnel excavation has a definite influence on the stress around the tunnel and the zone of major influence appears to extend to a distance of about one tunnel diameter from the tunnel wall.

(e) The average vertical stress measured at ch. 964 m in tunnel no. 3 is about 15 percent higher than the static vertical stress calculated from the weight of the rock and water above the test location. This is within the range of variations in the vertical stresses measured in Canada and other parts of the world.

(f) Due to the problem of the formation of bubbles in the glue, complete stress tensors were not measured in zones sufficiently far away from the tunnel excavation. The overall results indicate that the rock strata is under a moderately high insitu horizontal stress. The ratio of maximum horizontal to vertical insitu stresses is of the order of 2 to 3.

(g) In view of the effect of groundwater seepage on the bonding of the CSIRO gauge, the methodology to be used for the next series of stress measurements will have to be modified. Possible approaches include undertaking the measurements in less permeable but intrinsically weaker mudstone or pressurizing the hole with gas after installation of the CSIRO gauge and during curing of the glue. Backup USBM tests in two other

secondary, orthogonal holes would be required to augment the CSIRO tests.

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APPENDIX A

DRILLING LOG FOR
STRESS MEASUREMENT DRILL HOLE

October 1983

831-6014

RECORD OF BOREHOLE

SHEET 1 OF 2

LOCATION TUNNEL 3 CHAINAGE 9L41M LEFT WALL — BORING DATE JUNE 1/83 - JUNE 6/83 — DATUM GEODETIC

INCLINATION 4° UP AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, % (Wp — W — WL)	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACTURE INDEX PER 0.3m	DISCONTINUITY DATA: DIP°	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY	ADDITIONAL TESTING: WATER LEVELS AND NOTES	INSTRUMENTATION
0.00				0.00m													
10		FRESH, THICKLY BEDDED, LIGHT TO MEDIUM GREY FINE TO MEDIUM GRAINED SUBANGULAR - SUBROUNDED GRAINS TYPE I SANDSTONE CALCAREOUS COATINGS ON MOST FRACTURES.															
20																	
30																	
40		4.25m USBM °1 CORE LENGTH 0.93M												USBM FRACTURES			
50																	
60		5.77m CSIRO °1 CORE LENGTH 0.83M															
70																	
80		7.61-10.91m SANDSTONE CONTAINING CALCAREOUS CEMENT IN VARYING AMOUNTS.															
90		9.19m CSIRO °2 CORE LENGTH 0.62M															
100																	

DEPTH SCALE (ALONG HOLE) 1:50

Golder Associates

DRILLING LOGGED SK DRAWN SK

DATE JUNE 6/83 CHECKED [illegible]

RECORD OF BOREHOLE

SHEET 2 OF 2

LOCATION TUNNEL 3 CHAINAGE 9444 EASTWALL — BORING DATE JUNE 1/83 - JUNE 6/83 — DATUM GEODETIC

INCLINATION 4°UP — AZIMUTH — SAMPLER / PENETRATION TEST HAMMER WEIGHT — DROP

DEPTH METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	WATER CONTENT, %	RECOVERY: TOTAL CORE, %	RECOVERY: SOLID CORE, %	R.Q.D., %	FRACTURE INDEX, PER 0.5m	DISCONTINUITY DATA: DIP° (WITH CORE AXIS)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	ADDITIONAL TESTING	INSTRUMENTATION
10.0		USBM #2 : 10.10 M CORE LENGTH 0.64 M															
11.0																	
12.0																	
13.0		13.41 - END OF HOLE: SANDSTONE GRAIN SIZE INCREASING TO MED WITH MORE ROUNDED GRAINS. INCLUSIONS IN CARBONACEOUS PARTICLES. PRESENCE OF CALC. CEMENT															
14.0																	
15.0		CSIRO #3 14.91 M CORE LENGTH 0.64 M															
16.0		CSIRO #4 15.99 M CORE LENGTH 0.64 M															
17.0		USBM #3 16.77 M CORE LENGTH 0.66 M															
18.0																	
19.0		CSIRO #5 18.49 M CORE LENGTH 0.69 M															
		USBM #4 19.41 M CORE LENGTH 0.76 M END OF HOLE		19.41													
20.0																	

DEPTH SCALE (ALONG HOLE) 1:50

Golder Associates

ROCK LOGGED SL DRAWN SL

DATE 06/06/83 CHECKED

APPENDIX B

CALIBRATION OF USBM GAUGE

Appendix B - Calibration of USBM Gauge

Calibrations of the USBM gauge were carried out before and after the stress measurement using the set up shown on Figure B.1. The average calibration factors were used in the reduction of the test results. Results of the calibrations were presented in Table B1.

TABLE B.1

CALIBRATION OF USBM DEFORMATION GAUGE

Instrument No: USBM 1

Strain Indicator: P35A Gauge Factor: 0.4

CALIBRATION 1 - April 29, 1983

	BUTTON NO. 1 (U1)			BUTTON NO. 2 (U2)			BUTTON NO. 3 (U3)		
Displ (mm)	Instr. Rdg. (micro strain)	Difference Δ (micro strain)	Cal. F.	Instr. Rdg. (micro strain)	Difference Δ (micro strain)	Cal. F.	Instr. Rdg. (micro strain)	Difference Δ (micro strain)	Cal. F.
0	12000			15000			1000		
		3695	1.07		3715	1.06		3460	1.14
0.1	15695			18715			4460		
		3700	1.06		3778	1.04		3622	1.08
0.2	19395			22493			8082		
		3855	1.02		3849	1.02		3679	1.07
0.3	23250			26342			11761		
		3847	1.02		3779	1.04		3730	1.06
0.4	27097			30121			15492		
		4009	0.98		3953	1.00		2467	1.14
0.3	23088			26168			12025		
		3836	1.03		3853	1.02		3712	1.06
0.2	19252			22315			8313		
		3741	1.05		3779	1.04		3645	1.08
0.1	15511			18536			4668		
		3749	1.05		3676	1.07		3533	1.11
0	11762			14860			1135		
		Av. =	1.04		Av. =	1.09		Av. =	1.04
CALIBRATION 2 - June 2, 1983									
0	0			0			0		
		4000	0.98		3793	1.04		3926	1.00
0.1	4000			3793			3926		
		4095	0.96		3862	1.02		3895	1.01
0.2	8095			7655			7821		
		4048	0.97		3935	1.00		4029	0.98
0.3	12143			11590			11850		
		4215	0.93		3931	1.00		4184	0.94
0.4	16358			15521			16034		
		4157	0.95		3920	1.00		4161	0.95
0.5	20515			19441			20195		
		4245	0.93		3974	0.99		4257	0.92
0.6	24760			23415			24452		
		4214	0.93		3905	1.01		4258	0.92
0.7	28974			27320			28710		
		4490	0.88		4282	0.92		4540	0.87
0.6	24484			23038			24170		
		4252	0.93		4090	0.96		4282	0.72
0.5	20232			18948			19888		
		4234	0.93		3916	1.01		4160	0.95
0.4	10998			15032			15727		
		4146	0.95		3592	1.10		4103	0.96
0.3	11852			11440			11624		
		4031	0.98		3858	1.02		3952	1.00
0.2	7821			7582			7672		
		3915	1.01		4090	0.96		3929	1.00
0.1	3906			3492			3743		
		3822	1.00		3667	1.07		3817	1.03
0	-16			-175			-74		
		Av. =	0.95		Av. =	1.01		Av. =	0.96

TABLE B.1 (cont'd)

Average Calibration Factor: (Displacement in micro inches per microstrain)

Button No. 1 = 1.00
Button No. 2 = 1.00
Button No. 3 = 1.05

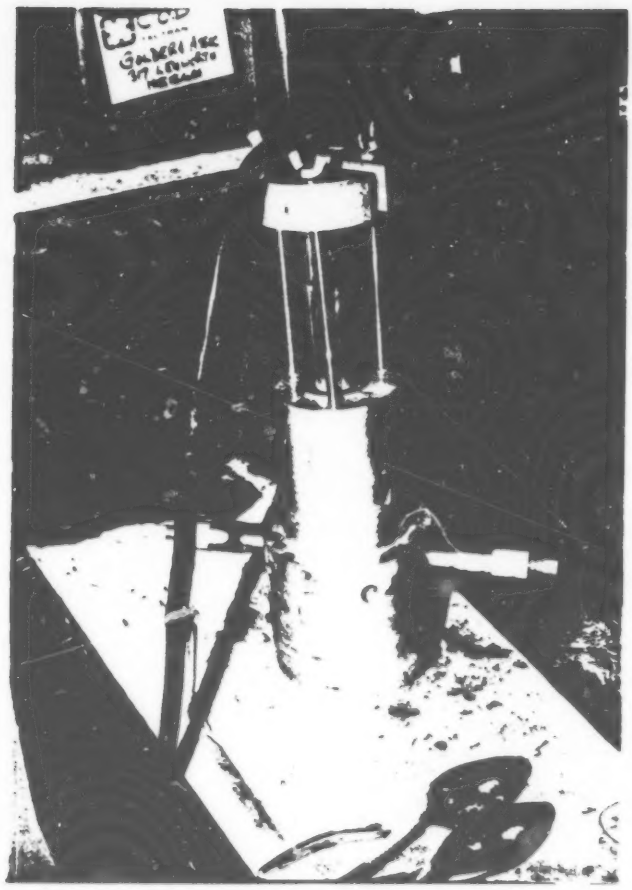


FIGURE B.1 EQUIPMENT FOR CALIBRATING USBM GAUGE

APPENDIX C

BIAXIAL TEST PROCEDURE AND CALIBRATION OF TEST EQUIPMENT

October 1983

831-6014

C.1 Biaxial Test Procedure

Biaxial tests were carried out on the overcores recovered from insitu tests to determine the elastic properties of the rock. The test set up is presented on Figure 6 and the procedure for this test is outlined as follows:

(i) To prepare the biaxial pressure chamber, remove the end plates, install a latex rubber membrane and replace the end plates, and attach the hydraulic pump.

(ii) Remove as much air as possible by means of a vacuum pump or similar.

(iii) Insert the overcored section to be tested making sure that the gauges are located in the centre of the biaxial chamber.

(iv) For USBM tests insert the gauges, the gauges are still in position for CSIRO tests.

(v) De-air the system completely by pumping hydraulic oil through the system until no air bubbles are present. Once this is done close the valve on the outlet side of the biaxial chamber.

(vi) Connect the strain measuring unit and switch box and take zero readings.

(vii) Pressurize the test chamber, using the hydraulic pump, taking readings every 1.4 MPa (200 psi) to a maximum of 13.8 MPa (2000 psi). Reduce the load in the same increments to zero.

Deformation modulus values were calculated from the dimensions of the overcore and the slopes of the plots of circumferential strain vs. biaxial cell pressure for CSIRO tests and diametral deformation vs. biaxial cell pressure for USBM tests. In each case three values were obtained, these were averaged and the modulus calculated. Poisson's ratio was also determined from the CSIRO tests taking the ratio of axial (Gauges 1, 7) to circumferential (Gauges 2, 6 and 8) strains. For some cores tests were carried out in both dry and saturated conditions to examine the effect of such conditions on the elastic properties.

C.2 Calibration of Test Equipment

The biaxial test equipment was calibrated by testing a hollow aluminum cylinder of known elastic properties. The USBM gauge was used to measure the deformation of the aluminum cylinder following the test procedure outlined above.

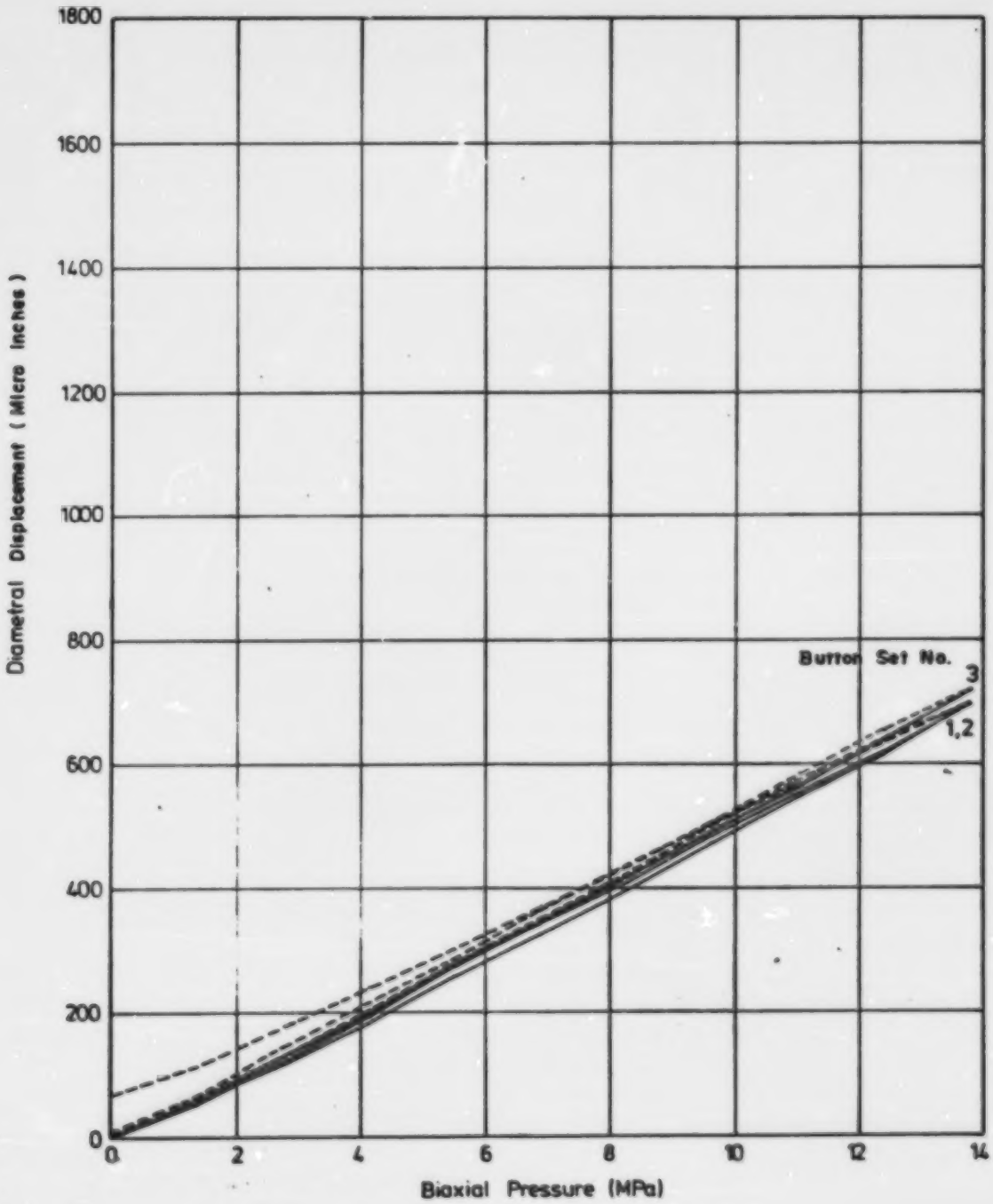
Based on the results of the calibration tests shown on Figure C.1, the deformation modulus of aluminum is:

Button Set No.	Deformation Modulus of Aluminum
1	72.89 GPa
2	72.89 GPa
3	72.48 GPa
Average	72.75 GPa

The calibration specimen was prepared from aluminum 2024-T351. The specified modulus of elasticity for this alloy is 73.09 GPa. The difference between this and the average deformation modulus shown above is less than 0.5 percent.

USBM ALUMINUM CALIBRATION CYLINDER TEST
BIAXIAL TEST RESULTS

FIGURE C.1



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APPENDIX D

INSTALLATION PROCEDURE OF CSIRO AND USBM GAUGES

D.1 Installation of CSIRO "Hollow Inclusion" Gauge

The installation procedure for the CSIRO gauge was generally in accordance with the manufacturers instructions and the experience acquired from previous measurements. An outline of the procedure is as follows:

(a) Core H-sized hole to a position approximately 250 mm short of the required position of the test.

(b) Extend the hole 600 mm using EX (38 mm diameter) coring equipment centralized using H-size drill rods (see Appendix E).

(c) Inspect the recovered EX core and decide the position to install the gauge. It is important to locate the gauge in a position where there are no fractures. If a suitable position is not found then the hole must be extended and steps (a) and (b) above are repeated.

(d) Determine the exact depth to the end of the H hole and the length of EX hole. It is very important to note these positions particularly when installing the CSIRO gauge.

(e) Check and prepare the CSIRO gauge. The gauge must be carefully prepared so that the epoxy adhesive will effectively bond to the gauge. The surface of the gauge is "roughed up" using sandpaper, cleaned with suitable degreasing agent and the rod used to extrude the glue cut to the required length. (Figure D.1).

(f) Clean the pilot hole. The hole is cleaned using a rod wrapped in bandages (Figure D.2) or similar, attached to the centralizing rollers. This is inserted in the

hole using the installation rods. After removing the cleaning tool, the bandages are inspected, the hole must be perfectly clean for CSIRO tests so that the epoxy adhesive will bond to the rock.

(g) Pour the mixed epoxy into the gauge (Figure D.3).

(h) Install the gauge and orient with mercury switch on the installation trolley. The gauge is pushed into the hole just short of the required position and the rods pushed in the last 75 mm using the drill rig; this extrudes the epoxy adhesive.

(i) Wait 12 hours for the glue to cure then remove rods.

(j) Thread the lead-out cable through the drill string and special water swivel and connect cable to the strain indicator and switching unit.

(k) The type of glue used is Ciba Geigy 1200 CA adhesive consisting of a resin and a hardener used at a ratio of 100 to 11 by weight.

(l) Take initial readings and check temperature of drill water.

(m) Overcore gauge using a 100 mm dia. thin wall bit, taking readings every 12.5 mm until the overcore bit is sufficiently past the gauge position (usually 200 mm).

(n) After the test, the core is broken and recovered for inspection and biaxial testing.

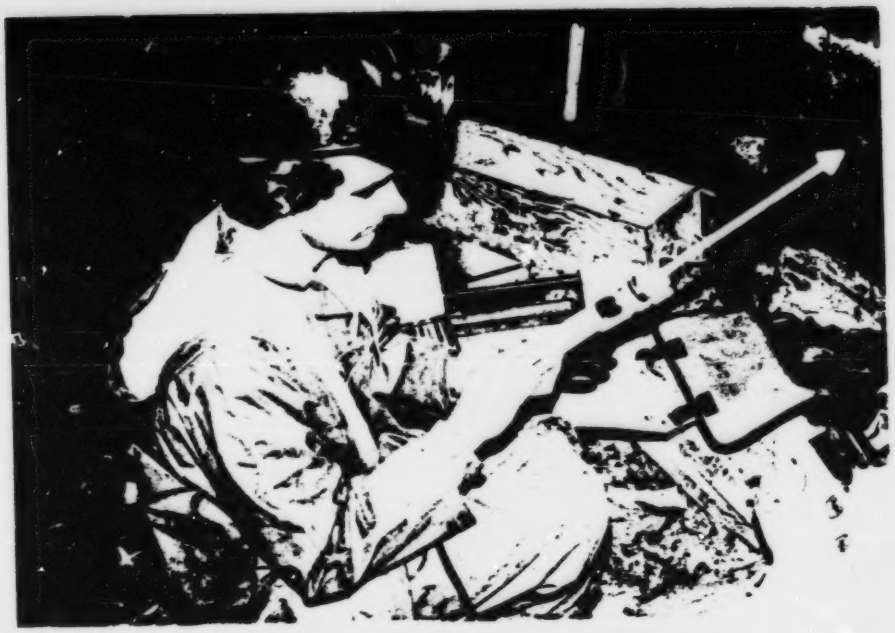
D.2 Installation of USBM Gauge

The installation of the USBM gauge is more straightforward as compared to that of the CSIRO gauge. As the unit is supported by the sensing buttons and a set of stabilizers on the rear end of the instrument body (see Figure 4), overcoring can proceed as soon as the instrument is placed in the required test position and the initial readings are stabilized. The preparation of the E hole, the final selection of test position, and the overcoring procedure would be the same as those for CSIRO test. The instrument would however be retrieved prior to recovering the overcored specimen.

D.3 Discussion on Installation Procedure

Apart from meticulous installation procedure, careful drilling is essential to ensure successful installation of the gauges. As the tests are conducted in horizontal holes, the E hole and the outer H hole must be concentric to facilitate installation of the gauges especially for the CSIRO gauge. Any excessive eccentricity would cause difficulties in the placement of the gauges and might on occasions cause premature extrusion of the glue in the case of the CSIRO gauge, if the leading guide rod happens to bear against the collar of the E hole during insertion. Such problem did arise in one case during this series of measurements.

As the depth of test increases, it becomes more difficult to maintain the concentricity of the holes due to the slight downward drift of the hole resulting from the weight of the drill string. The specialized overcoring equipment described in Appendix E was designed to maintain the concentricity of the holes during pilot drilling and subsequent overcoring.



a. SURFACE OF CSIRO GAUGE WAS ROUGHED UP TO FACILITATE BONDING OF THE CELL TO THE GLUE

b. THE RUBBER GASKET AT THE REAR END OF THE GAUGE WAS CHIPPED TO ALLOW AIR TO ESCAPE DURING EXTRUSION OF GLUE

FIGURE D.1 PREPARATION OF CSIRO GAUGE

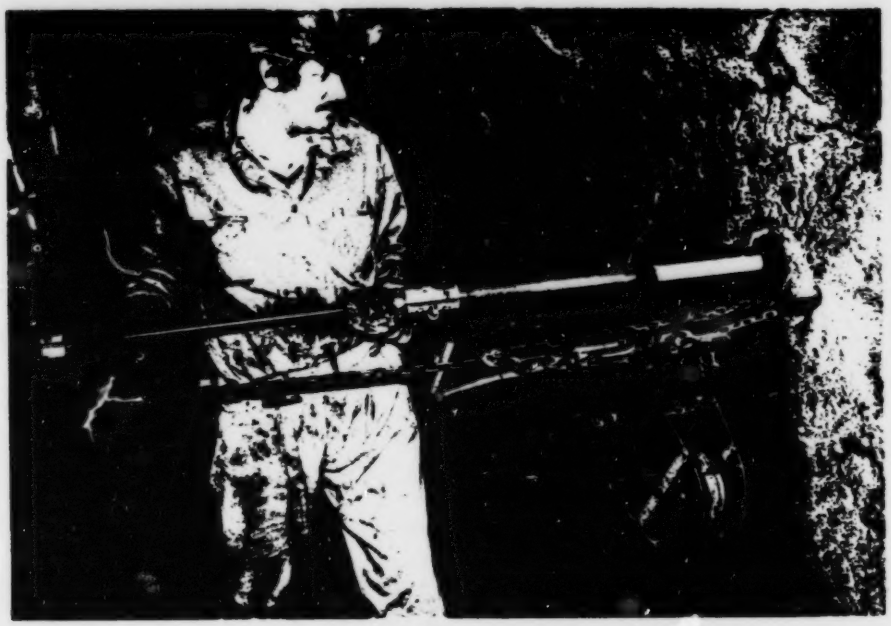


FIGURE D.2 INSERTION OF CLEANING TOOL WRAPPED WITH BANDAGE

FIGURE D.3 POURING MIXED EPOXY INTO THE CSIRO GAUGE

APPENDIX E

SPECIALIZED DRILLING EQUIPMENT FOR OVERCORING

October 1983

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Appendix E - Specialized Drilling Equipment for Cvercoring

The equipment described in this Appendix pertains to overcoring using a 100 mm diameter hole and a 38 mm diameter pilot hole. The overcoring equipment was designed to adapt to the commercially available HQ wireline drilling equipment and can be used either in horizontal or vertical down holes. The components of the drilling equipment are as follows:

(a) Underground drill rig capable of driving HQ equipment such as the Longyear 38 or equivalent.

(b) Water pump complete with pressure gauge readable to 1 psi.

(c) Special water swivel and water pressure regulator (to limit pressure to 40 psi).

(d) Standard HQ wireline drilling equipment with HQ driving rods.

(e) Modified inner tube assembly for the HQ system which carries the starter barrel for the E hole and the 1 m longer double tube E core barrel. This modified assembly latches in place of the conventional HQ inner tube assembly and is rotated and/or fed when the HQ rods are rotated and/or fed. As the modified inner tube assembly was machined to set concentrically with the HQ outer tube, the E hole drill with this assembly would be concentric with the H hole.

This system of drilling is especially advantageous when carrying out deep measurements in vertical downholes because the wireline system allows substantial saving

in the time for breaking up and assembling drill rod for drilling the holes. This system has been used successfully in several stress measurements in Ontario.

(f) 100 mm diameter thin wall overcoring bit adaptable to and driven by HQ rods acting as a continuous string of stabilizers along the boreholes. This eliminates the use of individual stabilizers and hence improves the efficiency.

(g) Core chisel and core retriever adaptable to EW rod for easy handling. Based on the experience of this series of tests, some improvement on the core retriever could be made.

The above equipment in general, performed satisfactorily during the tests.

A defective coupling in the E core barrel was detected after the first two tests and was subsequently replaced. Figure E.1 shows that the EX hole is reasonably centred in the overcore recovered from a depth of 19 m.

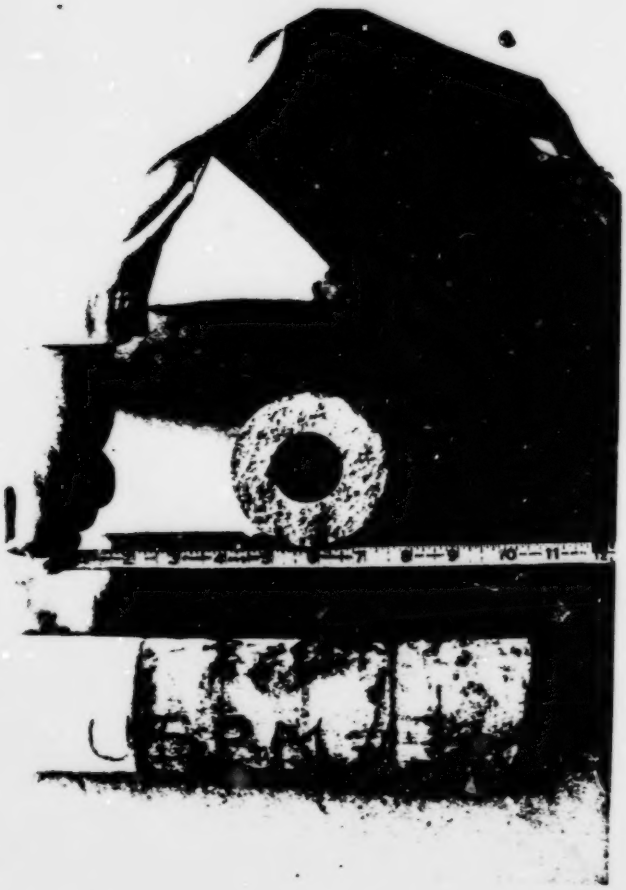


FIGURE E.1 OVERCORE FROM A DEPTH OF 19 m

TABLE 1

SUMMARY OF STRESS MEASUREMENT TEST POSITIONS
AND DIMENSIONS OF OVERCORES

STRESS MEASUREMENT TEST NO.	MEASURED DEPTHS (m)			OVERCORE DIMENSIONS (mm)		
	H*	EX**	GAUGES	INTACT LENGTH	I.D.	O.D.
CSIRO 1	5.33	5.77	5.54	254	38	87.6
CSIRO 2	8.53	9.19	8.93	305	38	87.6
CSIRO 3	14.28	14.90	14.60	356	38	85.9
CSIRO 4	15.16	15.79	15.46	432	38	85.9
CSIRO 5	17.69	18.49	18.00	254	38	85.7
USBM 1	3.63	4.25	3.89	203	38	87.6
USBM 2	9.46	10.10	9.71	305	38	87.6
USBM 3	16.14	16.77	16.39	305	38	87.1
USBM 4	18.65	19.41	19.00	254	38	85.7

* Measured depth to bottom of H hole prior to overcoring (top of stub).

** Measured depth to bottom of EX hole prior to overcoring.

TABLE 2

SUMMARY OF RESULTS OF CSIRO TESTS

STRAIN GAUGE NO.	STRAIN GAUGE ORIENTATION	STRAIN CHANGES IN PILOT HOLE				
		CSIRO TEST				
		1	2*	3**	4**	5**
1	A (Ax)	40	139	500	733	25
2	A (Circ)	192	319	-260	- 10	-55
3	A (45°)	- 25	486	- 40	150	-15
4	B (45°)	127	31	825	510	180
5	B (135°)	10	388	170	30	-60
6	B (Circ)	82	280	370	85	-100
7	C (Ax)	20	117	470	365	15
8	C (Circ)	98	151	-230	315	- 10
9	C (45°)	149	37	-340	110	- 10

* Reference point on gauge turned clockwise through 29° during installation due to problems with aligning tool.

** Sectioning of core indicated that cell was not perfectly glued; these tests have not been analyzed (see discussion in Section 5.2).

TABLE 3

SUMMARY OF RESULTS OF USBM TESTS

Button Set No.	DIAMETRAL DISPLACEMENT IN PILOT HOLES (micro inches)			
	USBM TEST			
	1	2	3	4
1	335	255	415	1175
2	80	370	1455	2180
3	355	665	2660	2170

Notes

1. * Diametral displacements are presented in micro inches using the following calibration factors.

   Button Set No. 1 = 1.00 (microinch for unit microstrain)

   Button Set No. 2 = 1.00

   Button Set No. 3 = 1.05

2. Button Set No. 1 was orientated in the vertical direction

TABLE 4

ELASTIC CONSTANTS DERIVED FROM BIAXIAL TESTS

Sample From Stress Measurement Test No.	Depth From Hole Collar (m)	DRY SAMPLE		WET SAMPLE	
		Young's Modulus (GPa)	Poisson's Ratio	Young's Modulus (GPa)	Poisson's Ratio
CSIRO 1	5.54	56.7	0.15	55.3	0.14
CSIRO 2	8.93	53.4	0.14	--	--
USBM 1	3.89	50.9	--	47.4	--
USBM 2	9.71	53.4	--	47.5	--
USBM 3	16.39	--	--	11.7	--
USBM 4	19.00	--	--	9.8	--

NOTE: Wet samples were prepared by soaking sample in distilled water for 24 hours prior to testing

TABLE 5

MAGNITUDES AND DIRECTIONS OF PRINCIPAL STRESSES MEASURED FROM CSIRO TESTS

TEST NO.	DEPTH FROM HOLE COLLAR (m)	MEASURED PRINCIPAL STRESSES									ELASTIC CONSTANTS USED FOR EVALUATION OF STRESSES	
		σ_1			σ_2			σ_3				
		Mag. (MPa)	Az. (Deg)	Dip (Deg)	Mag. (MPa)	Az. (Deg)	Dip (Deg)	Mag. (MPa)	Az. (Deg)	Dip (Deg)	E (GPa)	ν
CSIRO 1	5.54	6.0	67.4	47	0.08	92.1	-40.3	2.38	171.2	12.5	55.3	0.15
CSIRO 2	8.93	14.02	129.8	-16.4	2.52	47.6	27.1	5.42	11.3	-57.6	53.4	0.14

NOTES:

(1) σ_1, σ_2 and σ_3 are the principal stresses evaluated from the strain data in Table 2 and the elastic constants shown.

(2) Azimuths shown are in relation to tunnel axis. (Azimuth of tunnel axis is 15° east of north).

(3) Dip angle shown is the angle between the stress direction and the horizontal. +ve dip indicates angle below horizontal measured in a clockwise direction.

TABLE 6

MAGNITUDES AND DIRECTIONS OF SECONDARY PRINCIPAL STRESSES MEASURED FROM USBM TESTS

TEST NO.	DEPTH FROM HOLE COLLAR (m)	MEASURED STRESSES			ELASTIC CONSTANTS USED FOR EVALUATION OF STRESSES	
		MAX. STRESS P (MPa)	MIN. STRESS Q (MPa)	ORIENTATION OF P FROM VERTICAL DIRECTION (Deg)	E (GPa)	ν
USBM 1	3.89	5.57	2.72	148.1	47.4	0.15
USBM 2	9.75	8.94	4.99	112.1	47.5	0.15
USBM 3	16.39	8.63	3.44	106.2	11.7	0.15
USBM 4	19.00	7.26	5.03	89.8	9.8	0.15

NOTES:

(1) P and Q are respectively the maximum and mimum stresses measured on the plane perpendicular to the axis of the stress measurement drill hole. These stresses are evaluated from the data in Table 2 and the elastic constants shown.

(2) Orientation of P is measured counter clockwise from the vertical direction.

TABLE 7

COMPARISON OF STRESSES FROM CSIRO AND USBM TESTS

TEST NO.	DEPTH FROM HOLE COLLAR (m)	STRESS COMPONENTS ON A PLANE PERPENDICULAR TO DRILLHOLE AXIS		STRESS COMPONENT PERPENDICULAR TO TUNNEL AXIS
		σ_x (MPa)	σ_z (MPa)	σ_y (MPa)
USBM 1	3.89	3.52	4.77	-
CSIRO 1	5.54	2.60	3.35	2.48
CSIRO 2	8.93	7.84	5.46	9.04
USBM 2	9.71	8.38	5.55	-
USBM 3	16.39	8.23	3.84	-
USBM 4	19.00	7.26	5.03	-

NOTES:

(1) σ_x and σ_z are stress components on a plane perpendicular to the drillhole axis.

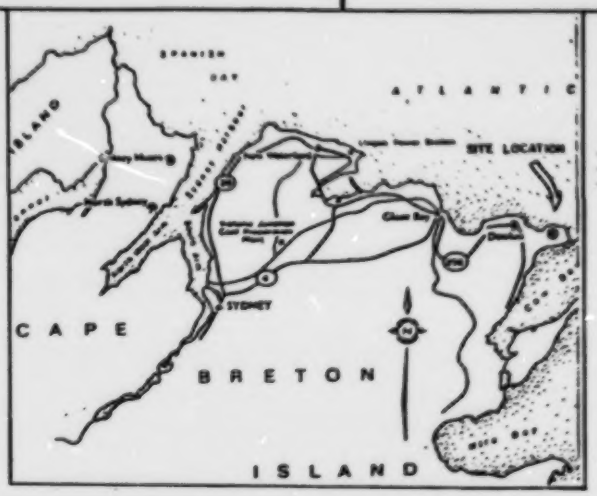
(2) σ_x is the horizontal stress component along the direction of the tunnel axis (Az. of tunnel axis = 15° east of north)

(3) σ_z is the vertical stress component.

(4) σ_y is the horizontal stress component along the axis of the borehole (perpendicular to tunnel axis).

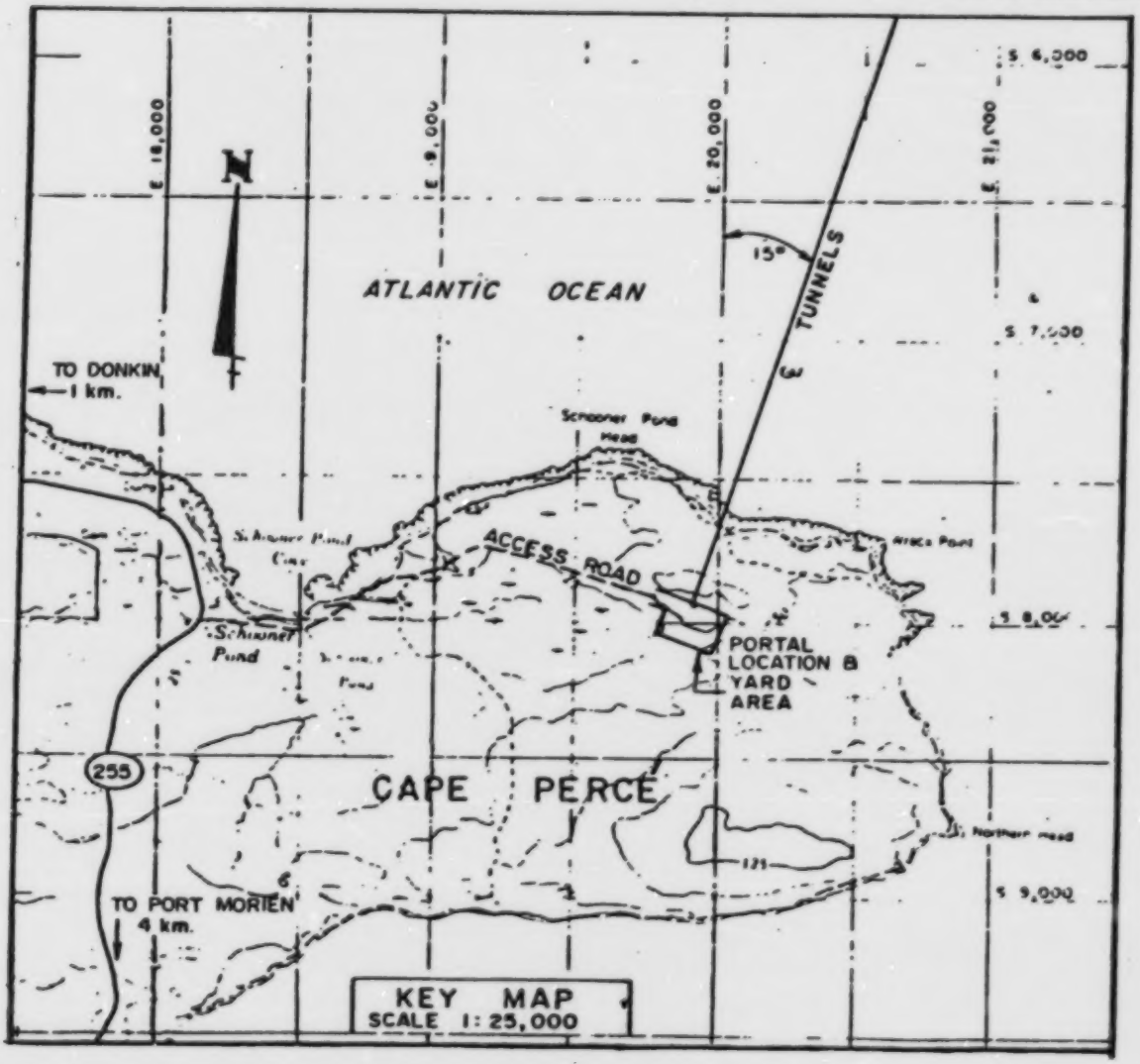
SITE LOCATION PLAN

FIGURE 1



LEGEND
- TOWNS
- SITE
- ROADS
- RAILWAYS

0 5 10 km



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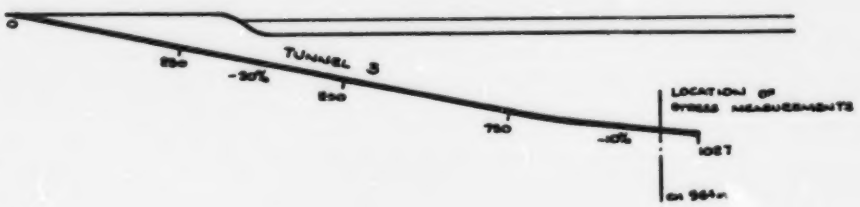
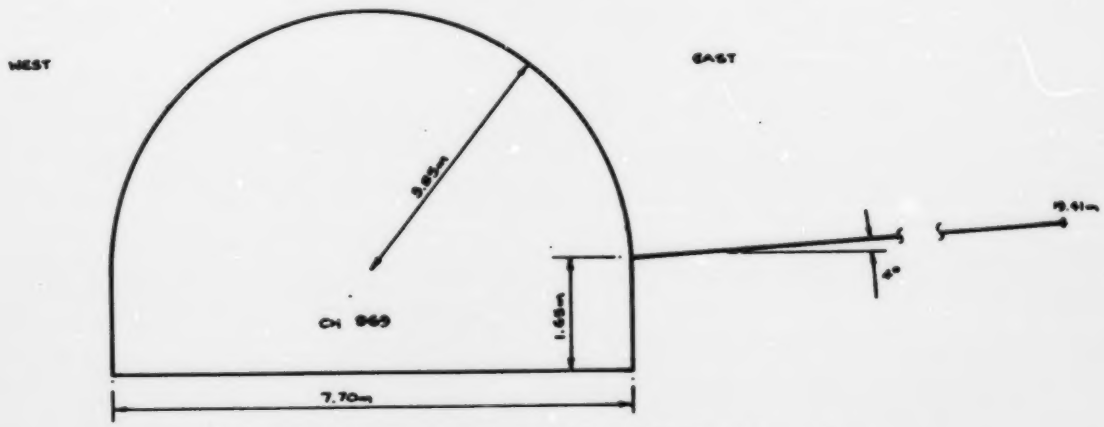
LAYOUT OF STRESS MEASUREMENT STATION

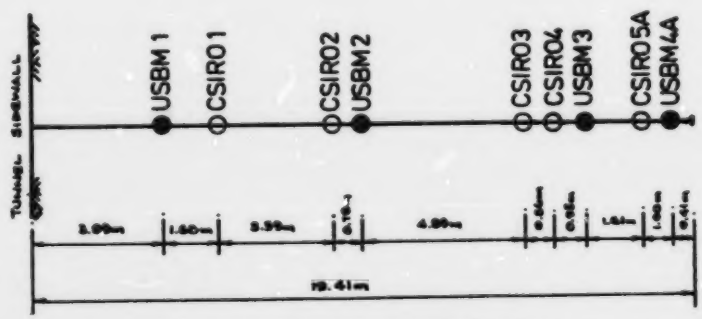
FIGURE 2



LONGITUDINAL SECTION OF TUNNEL 3 SHOWING LOCATION OF INSITU STRESS MEASUREMENTS



SECTION SHOWING POSITION OF STRESS MEASUREMENT HOLE



POSITION OF STRESS MEASUREMENT TESTS

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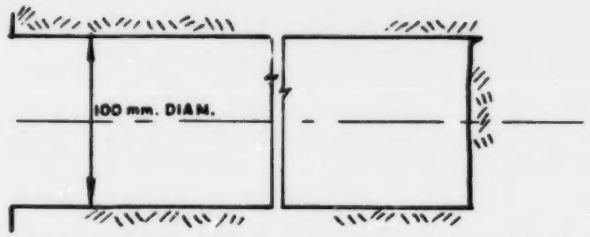
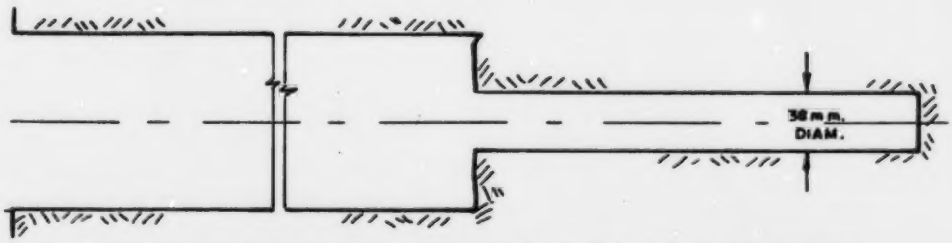
STRESS MEASUREMENT BY OVERCORING METHOD

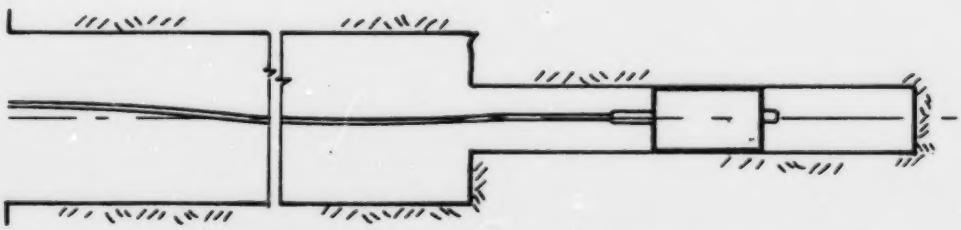
FIGURE 3



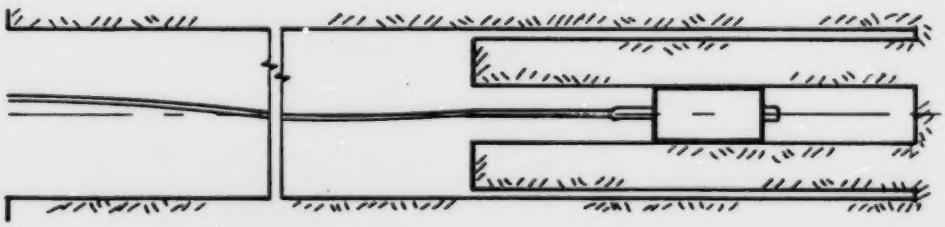
(A) 100mm DIAMETER BOREHOLE DRILLED TO THE DEPTH AT WHICH THE STRESS IS TO BE DETERMINED.



(B) EXT BOREHOLE DRILLED FOR 500 mm TO 600 mm INTO THE END OF THE BOREHOLE.



(C) CSIRO OR USBM BOREHOLE GAUGE INSTALLED IN CENTRAL SECTION OF EXT BOREHOLE.



(D) EXT BOREHOLE OVERCORED USING A 100 mm DIAMETER THINWALL BIT.

NOT TO SCALE

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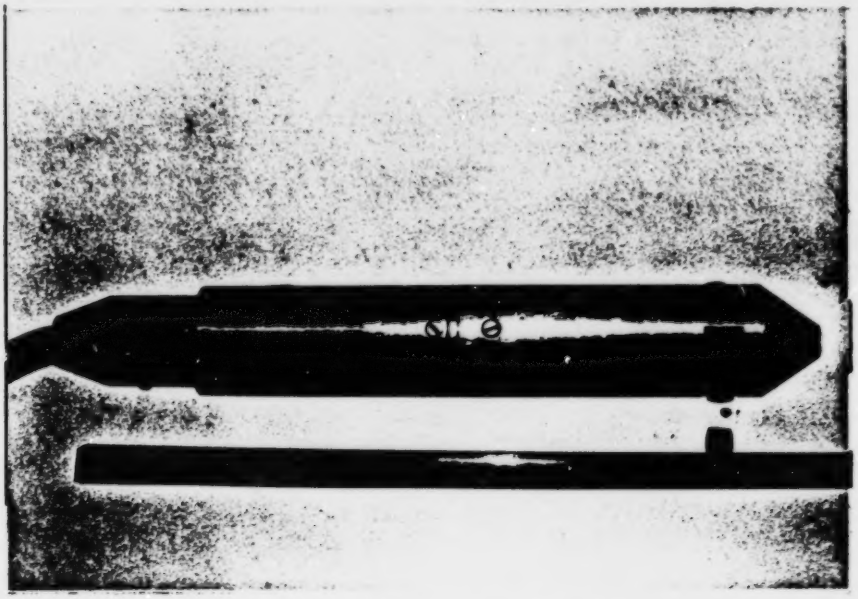
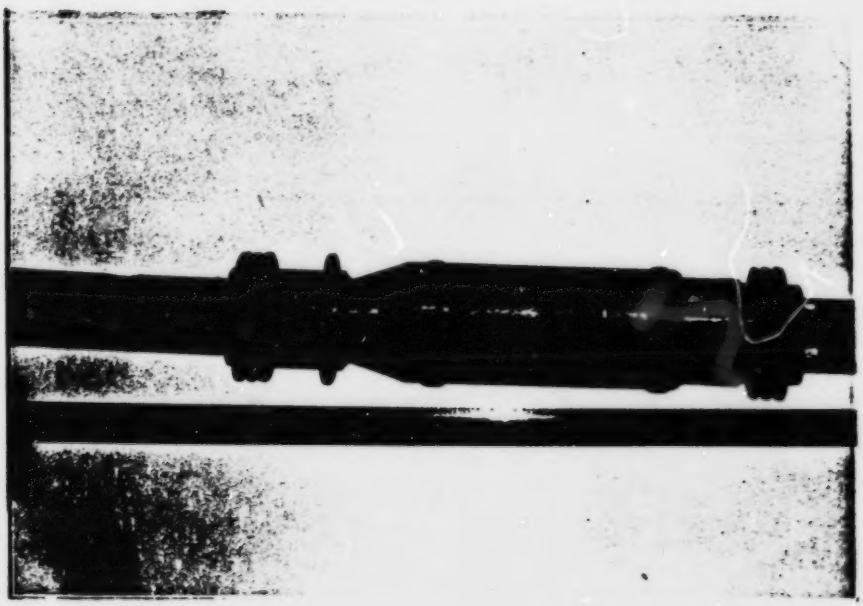


a. USBM DEFORMATION GAUGE



b. CSIRO "HOLLOW INCLUSION" GAUGE

FIGURE 4 USBM GAUGE AND CSIRO "HOLLOW INCLUSION" GAUGE

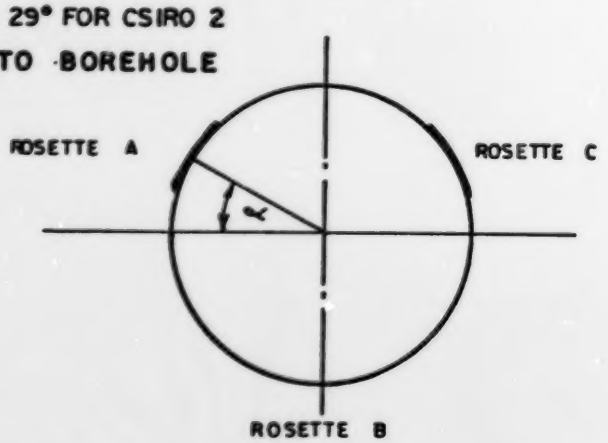
ORIENTATION OF STRAIN GAUGES IN CSIRO "HOLLOW INCLUSION" GAUGE

FIGURE 5

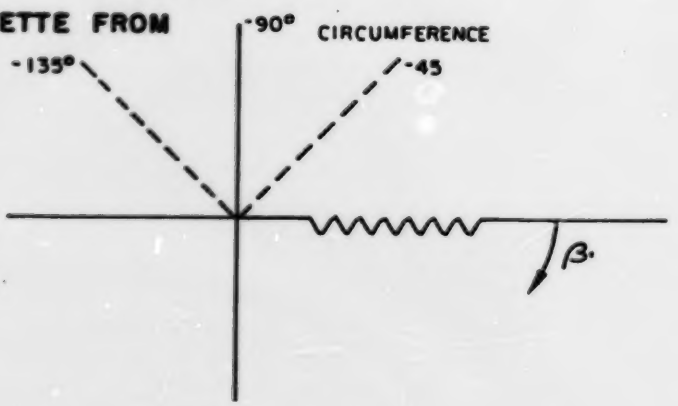
GAUGE	ROSETTE	ANGLE α (degrees)*	ANGLE β (degrees)
1		52.9	0
2	A	30	- 90
3		30	- 45
4		253.6	- 45
5	B	253.6	- 135
6		270	- 90
7		172.9	0
8	C	150	- 90
9		150	- 45

* ADD 29° FOR CSIRO 2

VIEW LOOKING INTO BOREHOLE



VIEW LOOKING AT ROSETTE FROM BOREHOLE CENTRELINE



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Chkd.

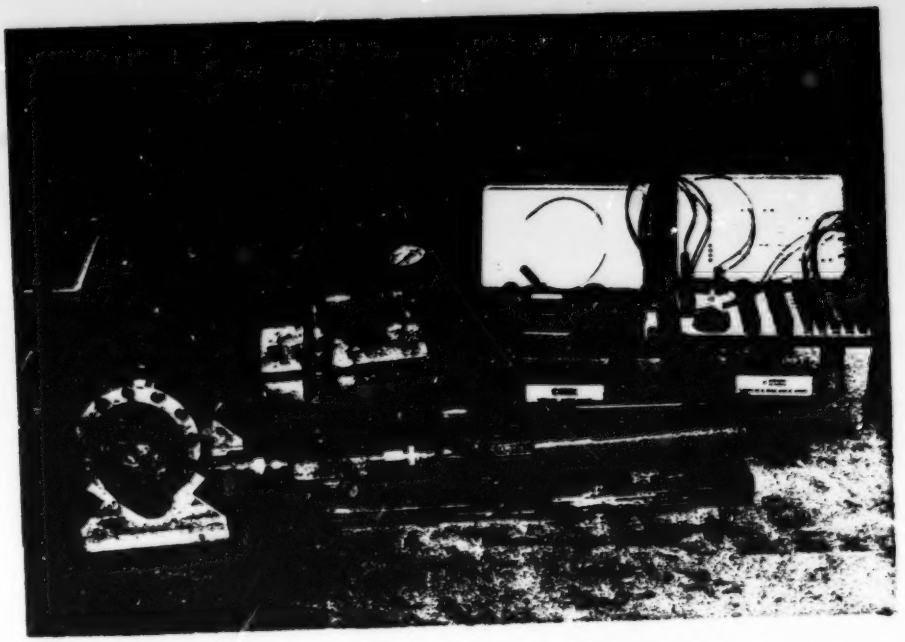


FIGURE 6 SET-UP FOR BIAXIAL TESTS

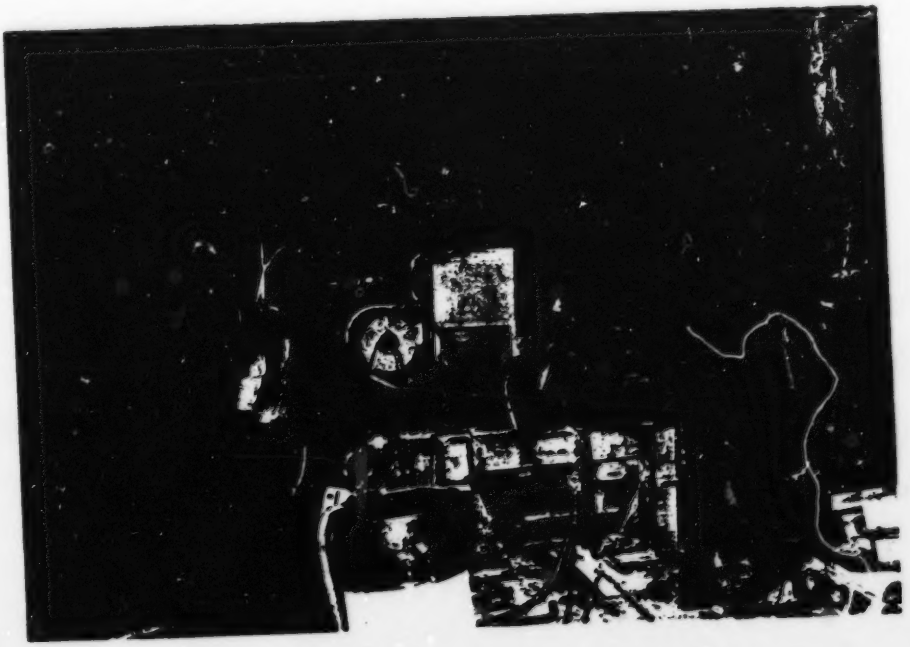
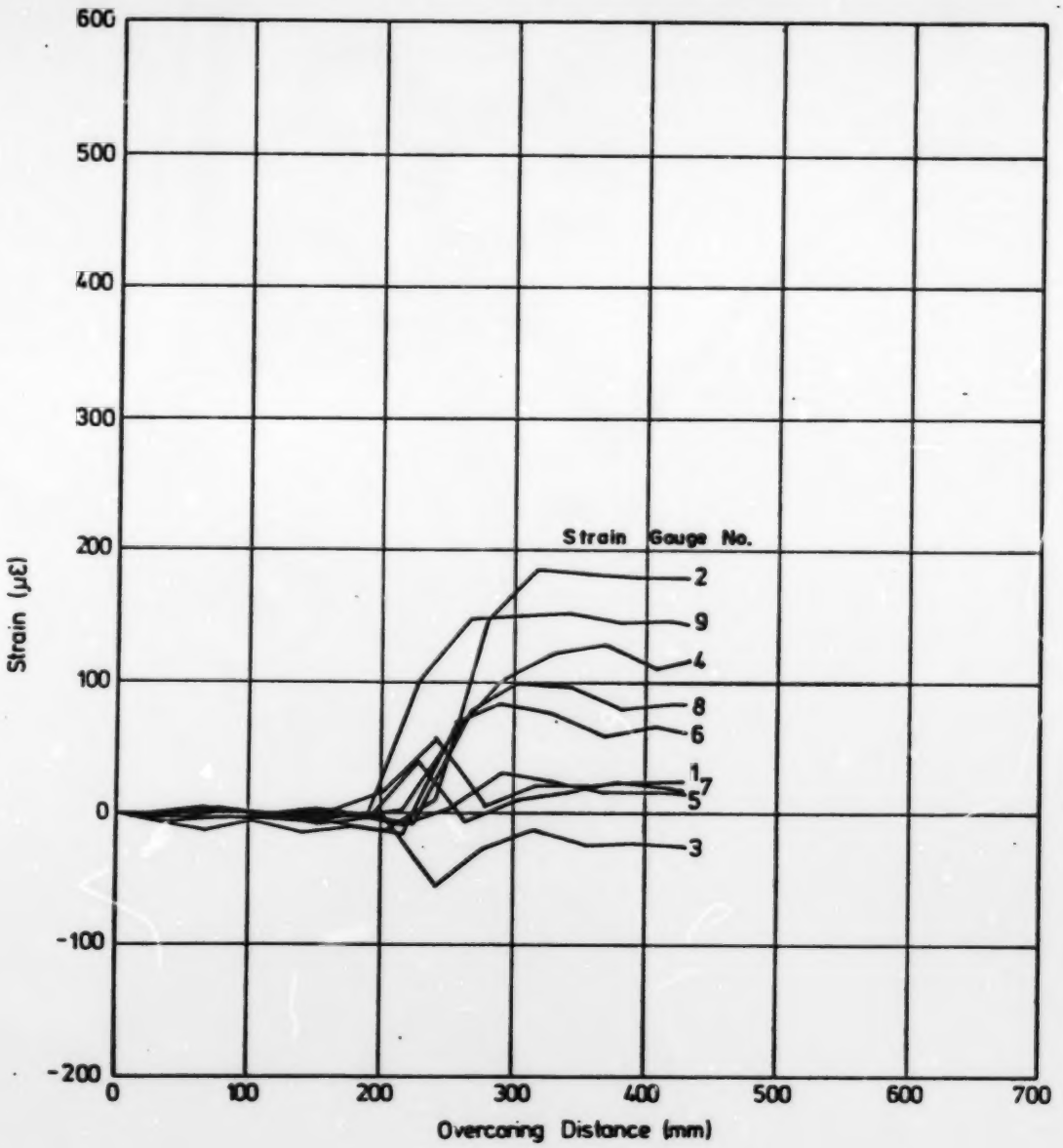


FIGURE 7 GENERAL ARRANGEMENT OF DRILL RIG FOR INSITU STRESS MEASUREMENT

CSIRO TEST NO. 1
OVERCORING RESPONSE

FIGURE 8



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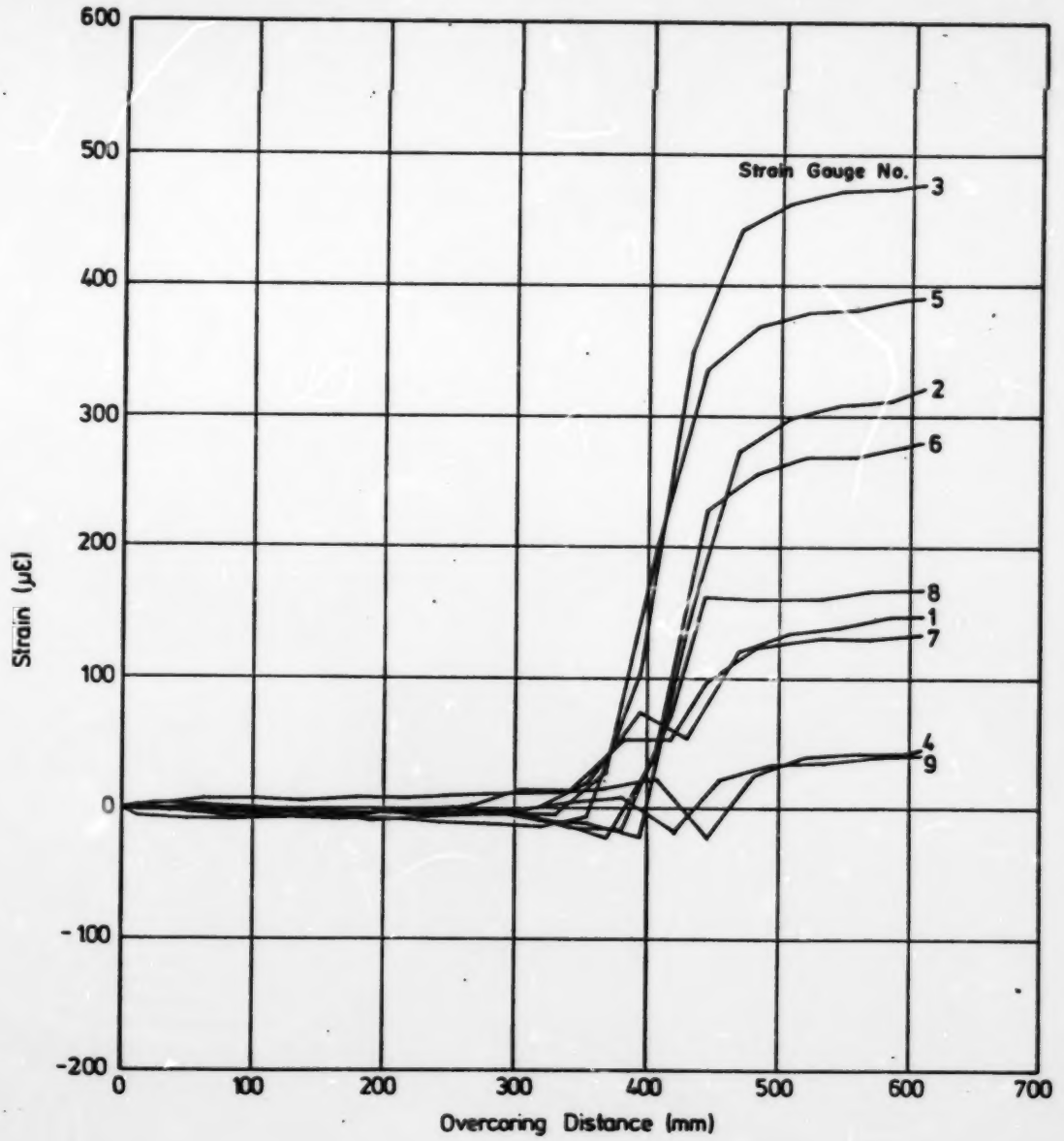
CSIRO TEST NO. 2
OVERCORING RESPONSE

FIGURE 9



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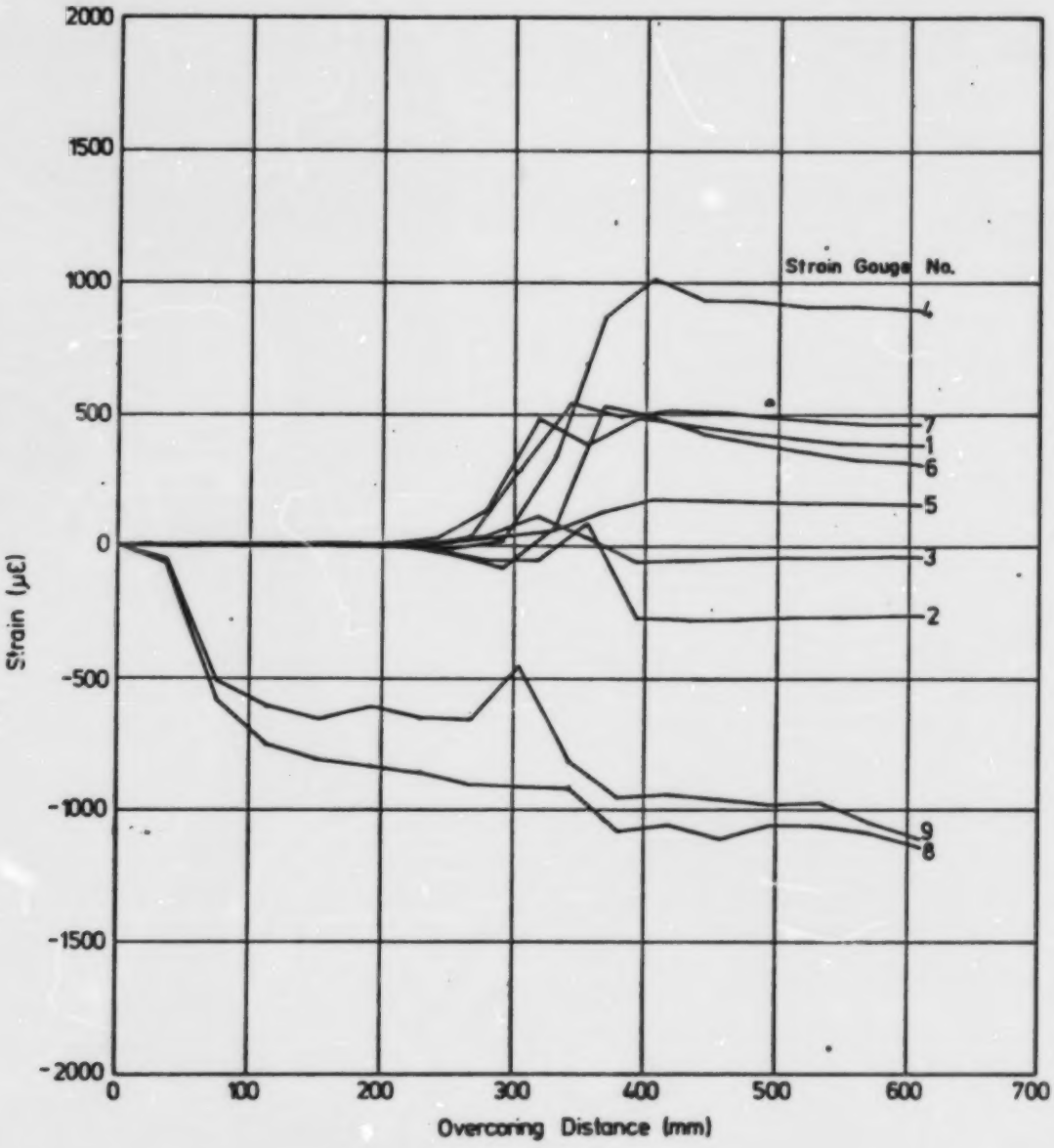
CSIRO TEST NO. 3
OVERCORING RESPONSE

FIGURE 10



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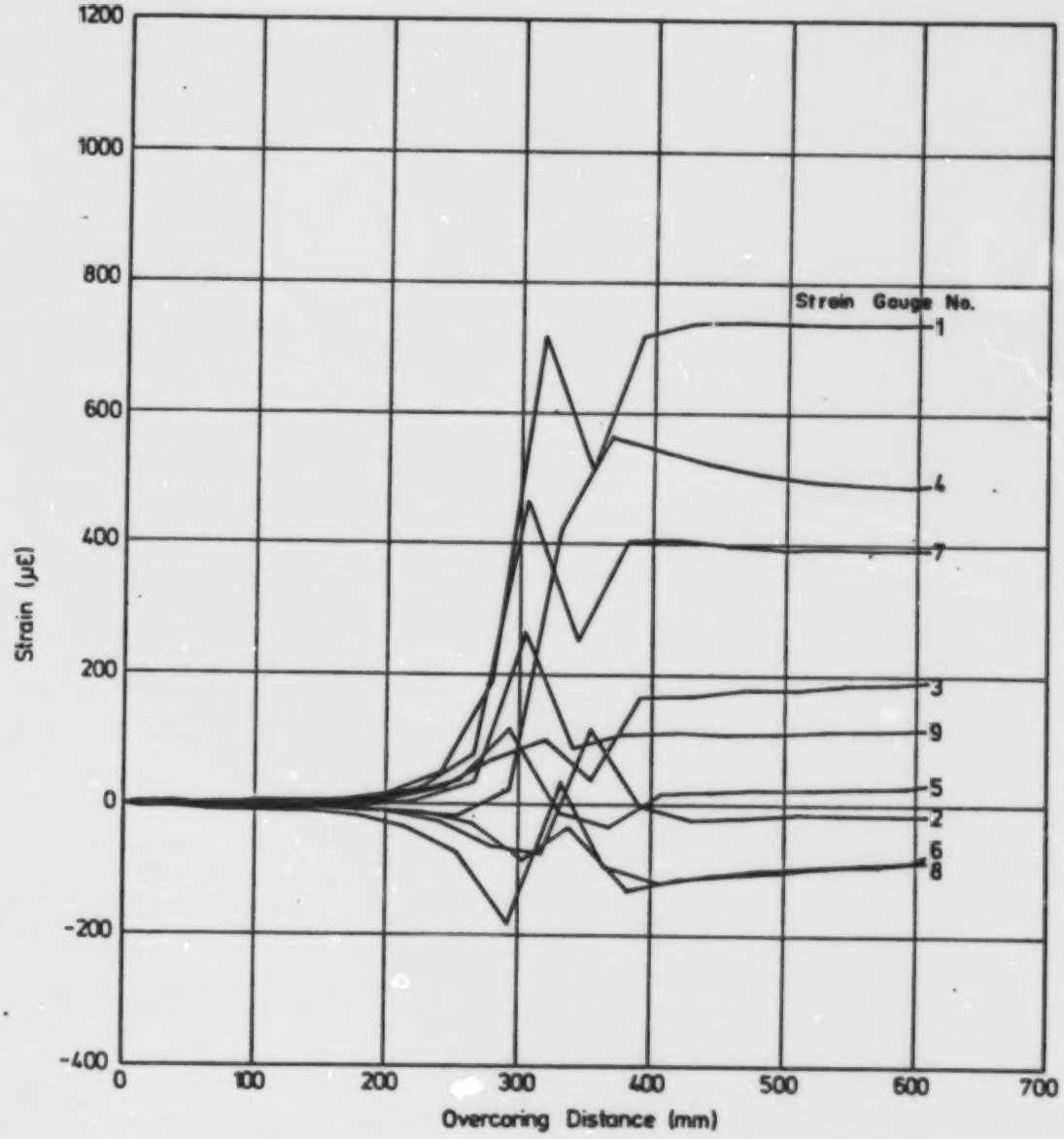
CSIRO TEST NO. 4
OVERCORING RESPONSE

FIGURE 11



Date JULY 28,1983
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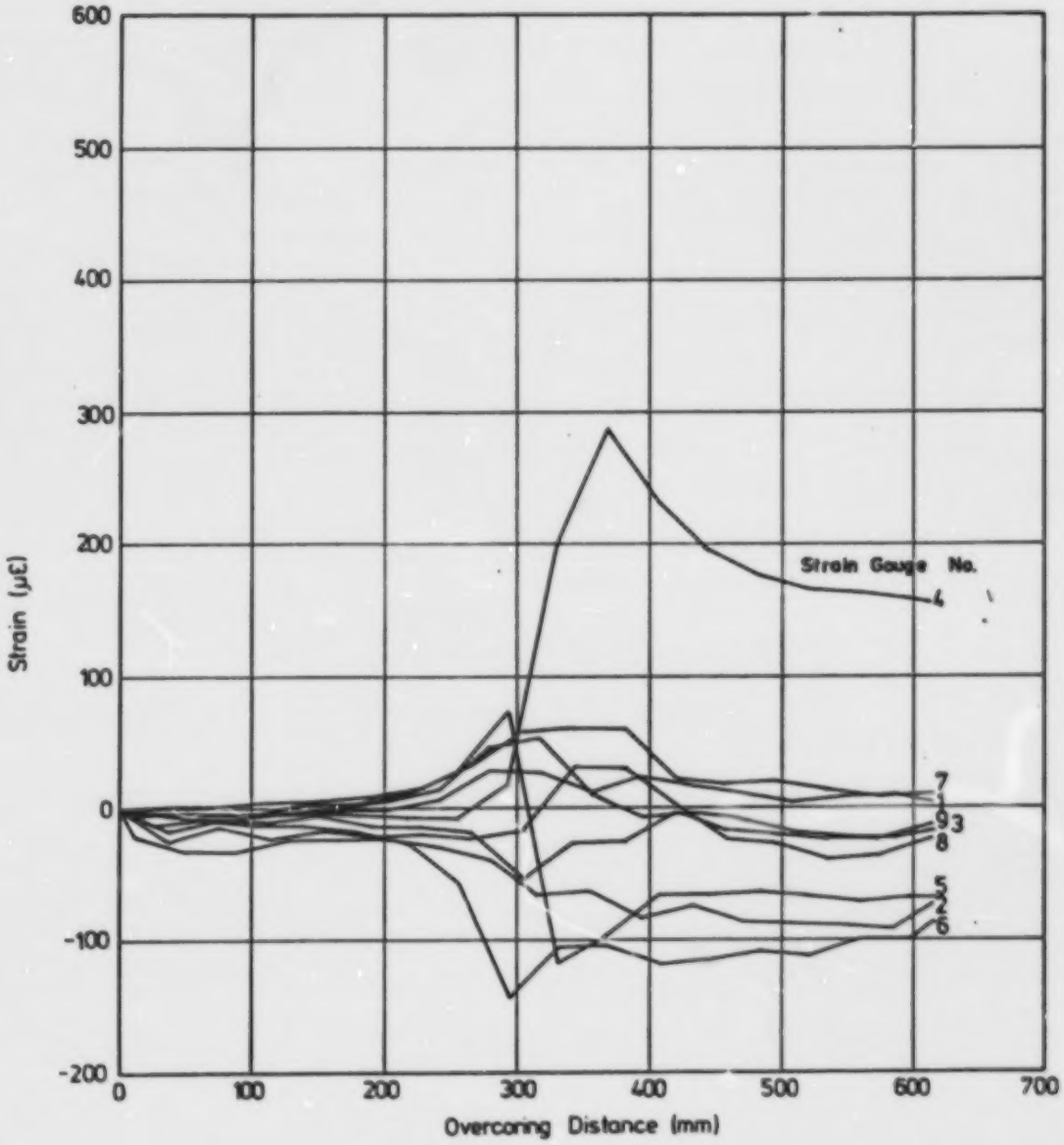
Chkd

CSIRO TEST NO. 5
OVERCORING RESPONSE

FIGURE 12



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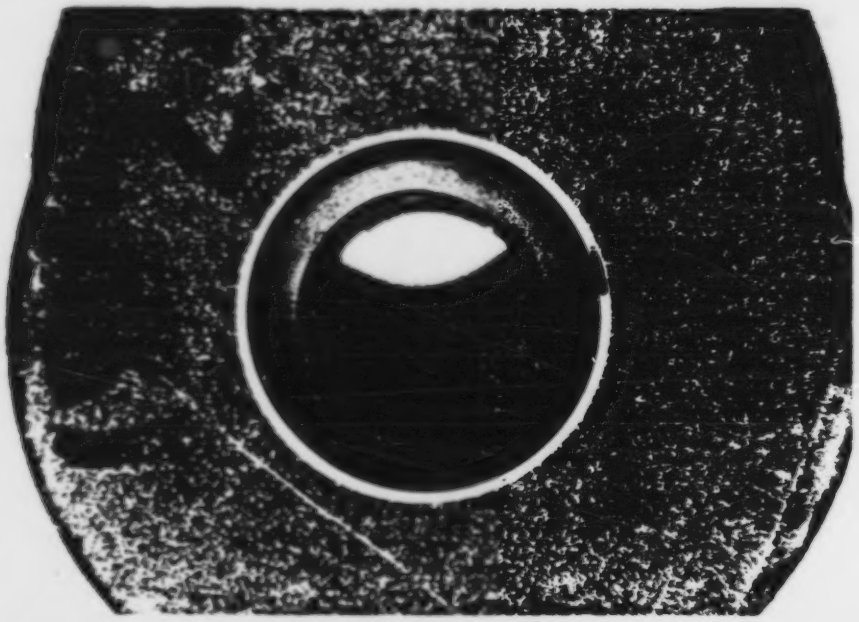
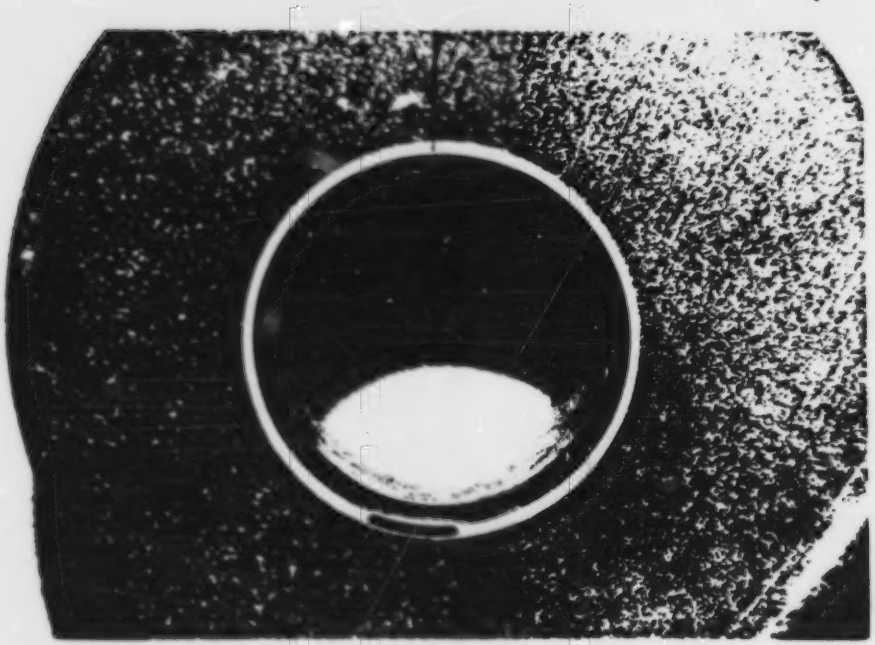
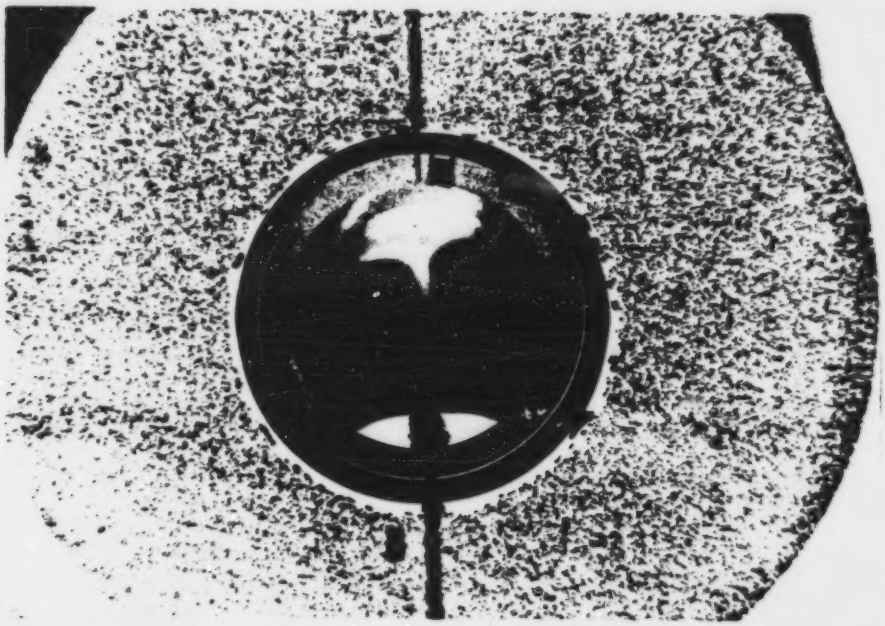


a. CSIRO TEST NO. 1

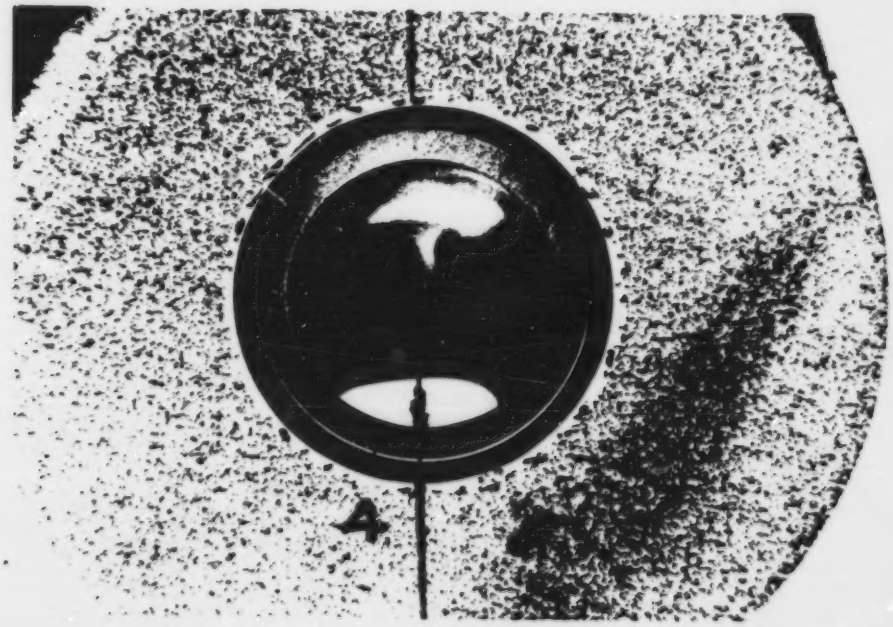


b. CSIRO TEST NO. 2

FIGURE 13 SECTIONED OVERCORE SAMPLES FROM CSIRO TEST LOCATIONS (TESTS NO. 1 & 2)

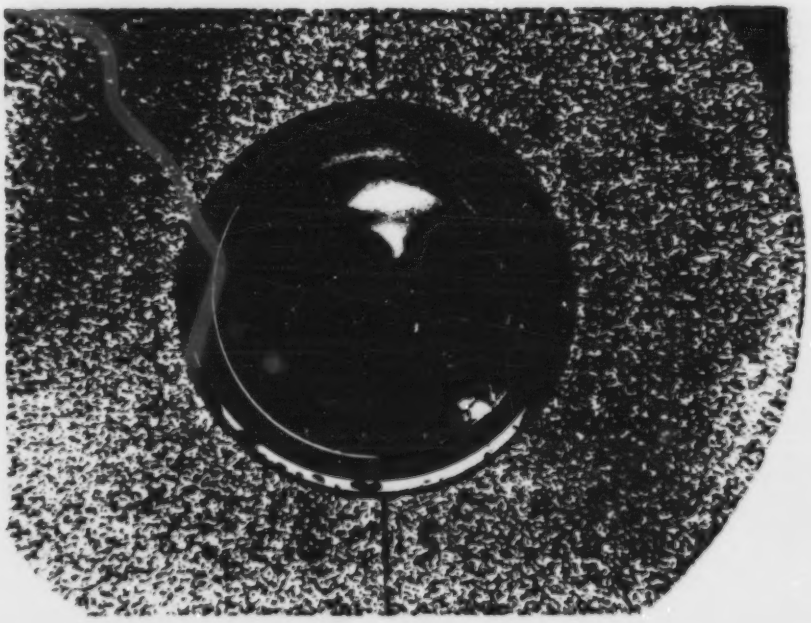


a. CSIRO TEST NO. 3



b. CSIRO TEST NO. 4

FIGURE 14 SECTIONED OVERCORE SAMPLES FROM CSIRO TEST LOCATIONS (TESTS NO. 3 TO 5)

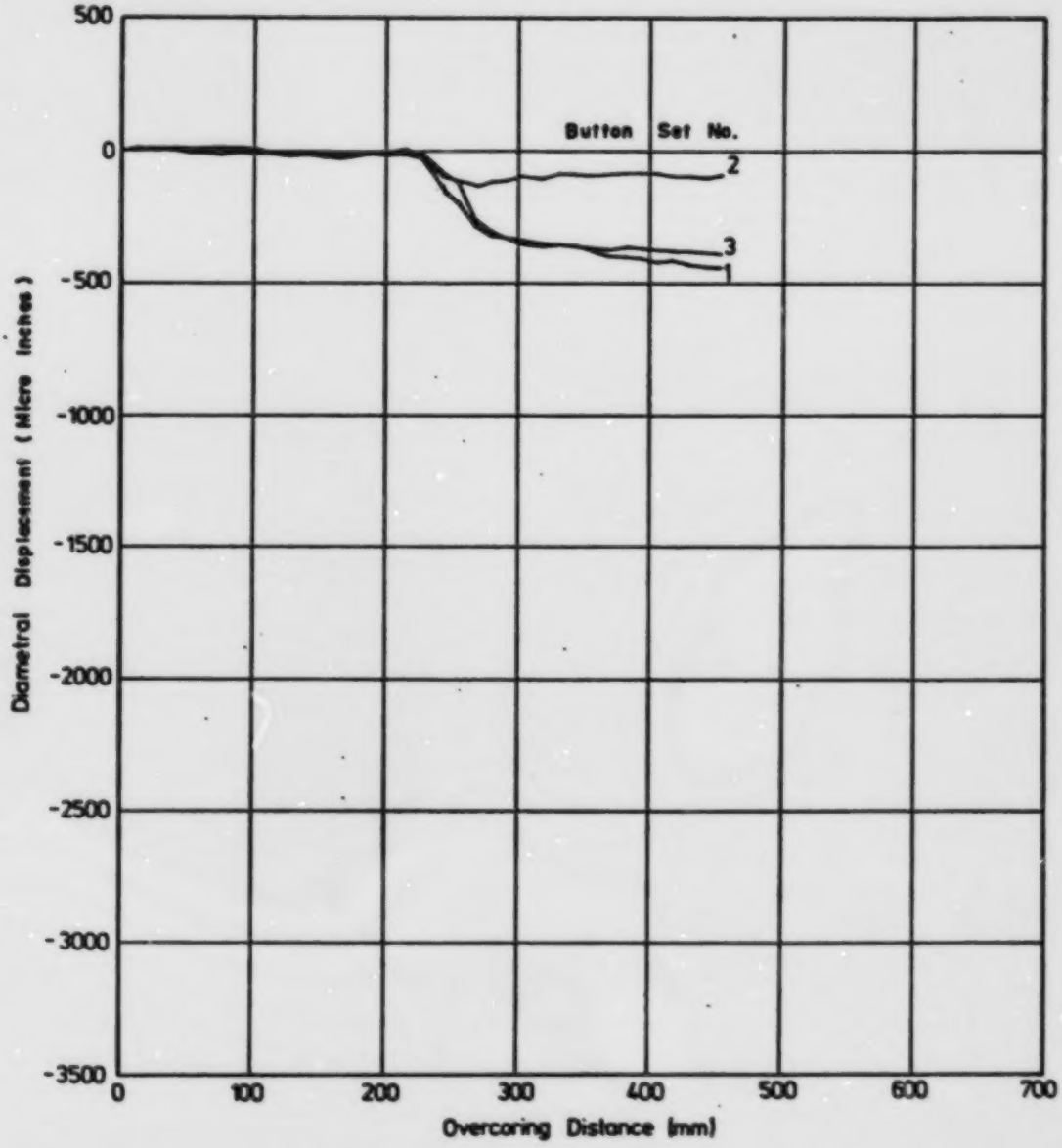


c. CSIRO TEST NO. 5

FIGURE 14 SECTIONED OVERCORE SAMPLES FROM CSIRO TEST LOCATIONS (TESTS NO. 3 TO 5)

USBM TEST NO. 1
OVERCORING RESPONSE

FIGURE 15



Date JULY 28, 1983
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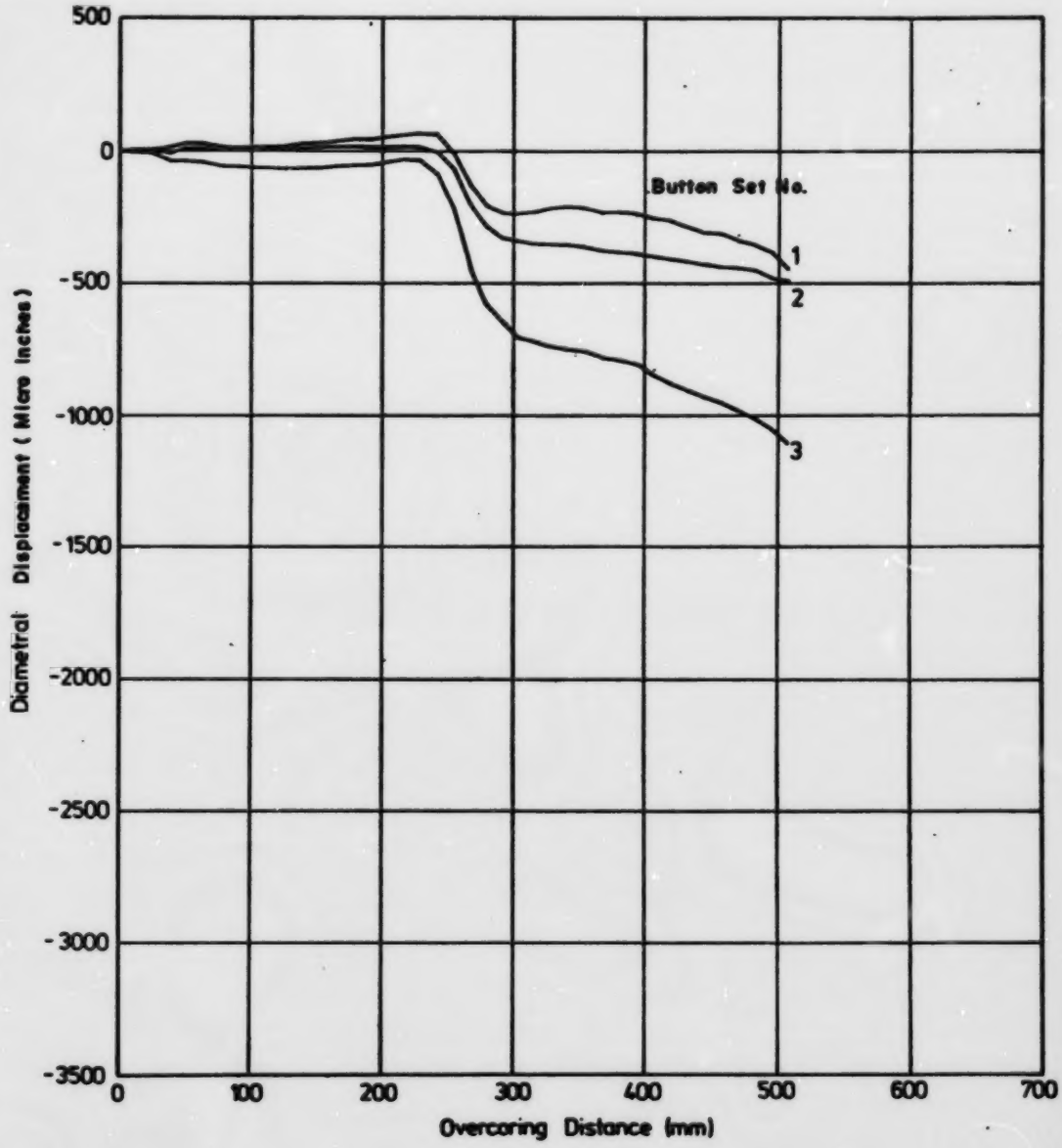
USBM TEST NO. 2
OVERCORING RESPONSE

FIGURE 16



Date JULY 28 1983
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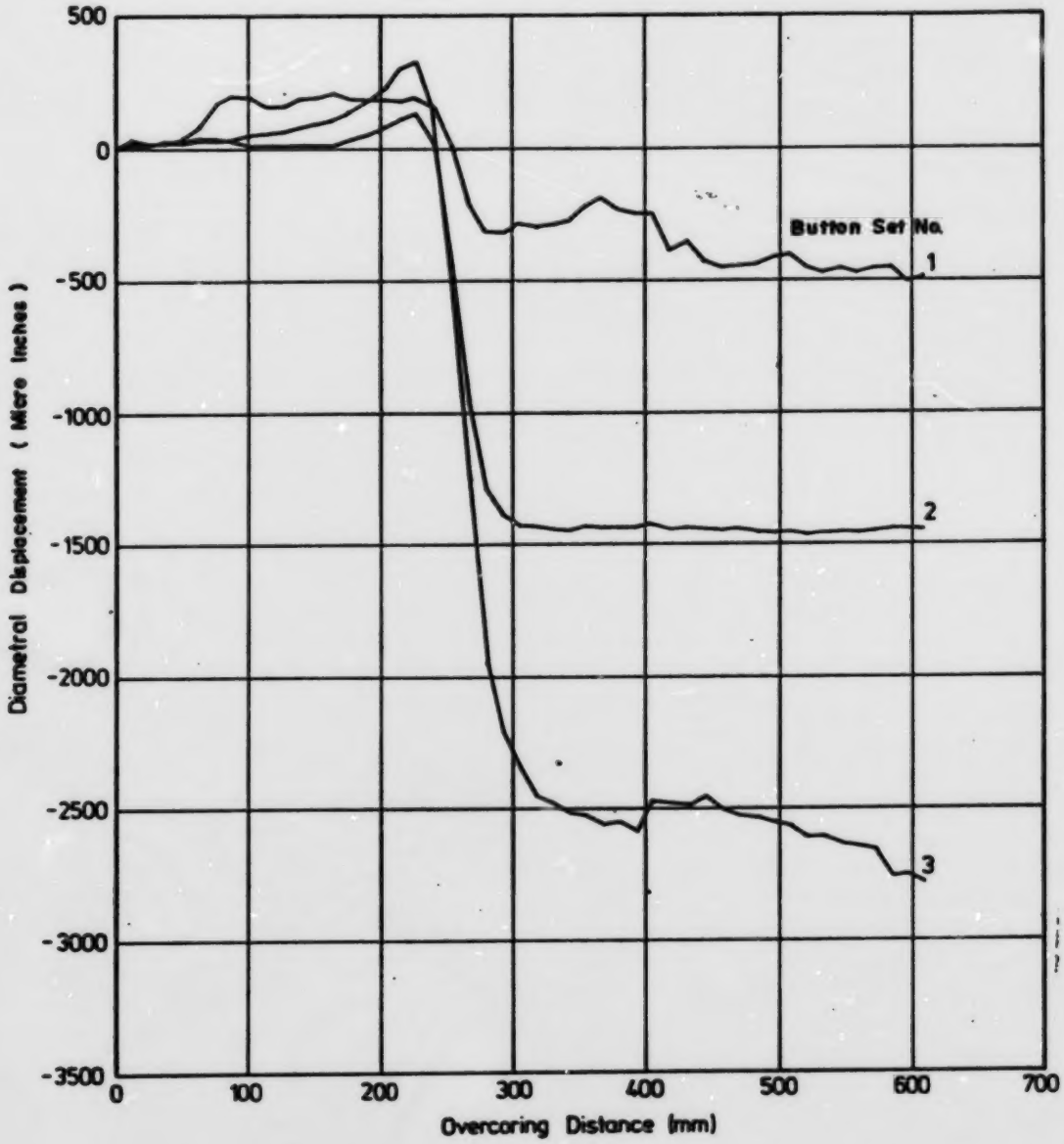
Chkd

USBM TEST NO. 3
OVERCORING RESPONSE

FIGURE 17



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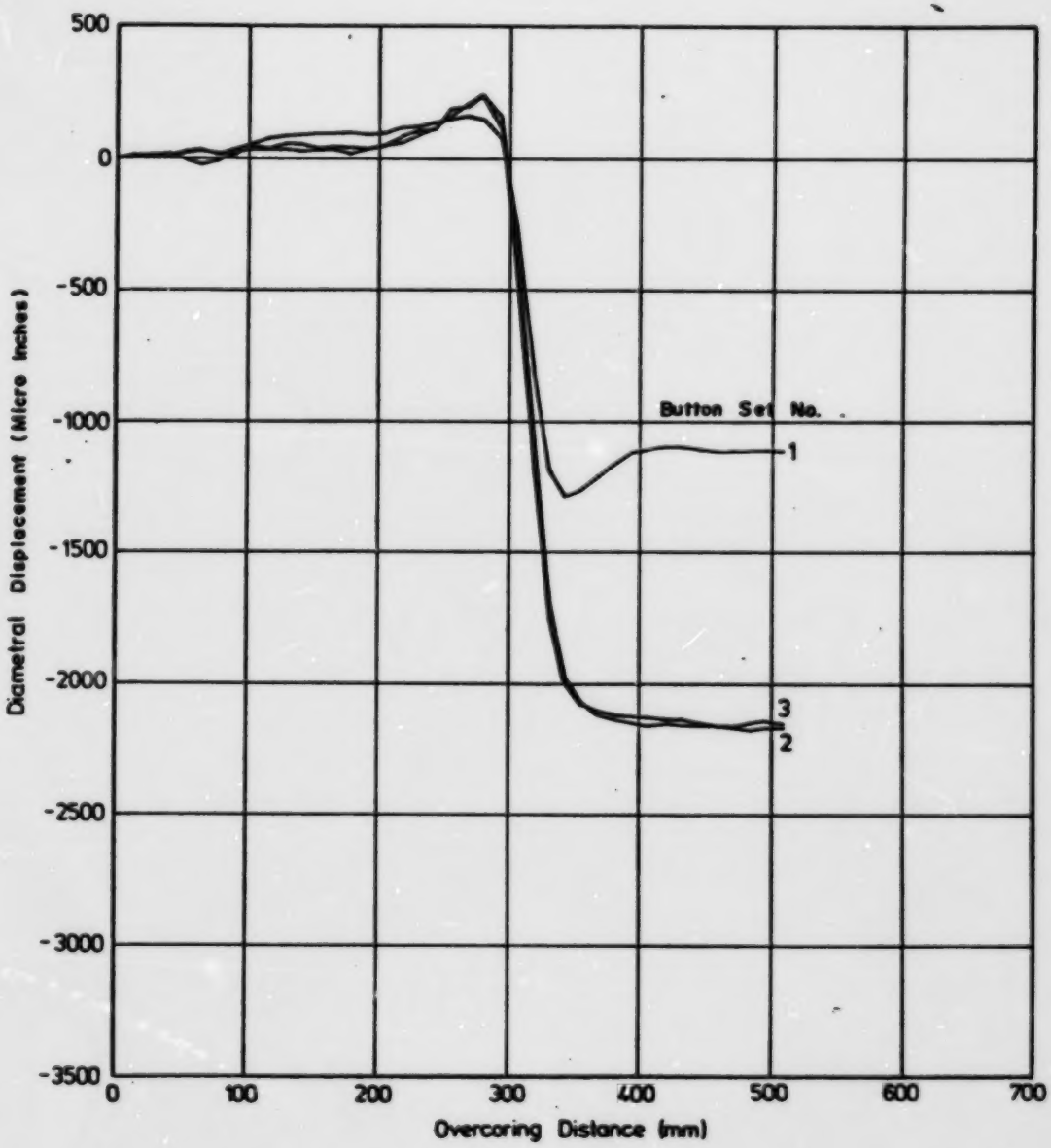
USBM TEST NO. 4
OVERCORING RESPONSE

FIGURE 18



Date JULY 28,1983
Project 831-6014

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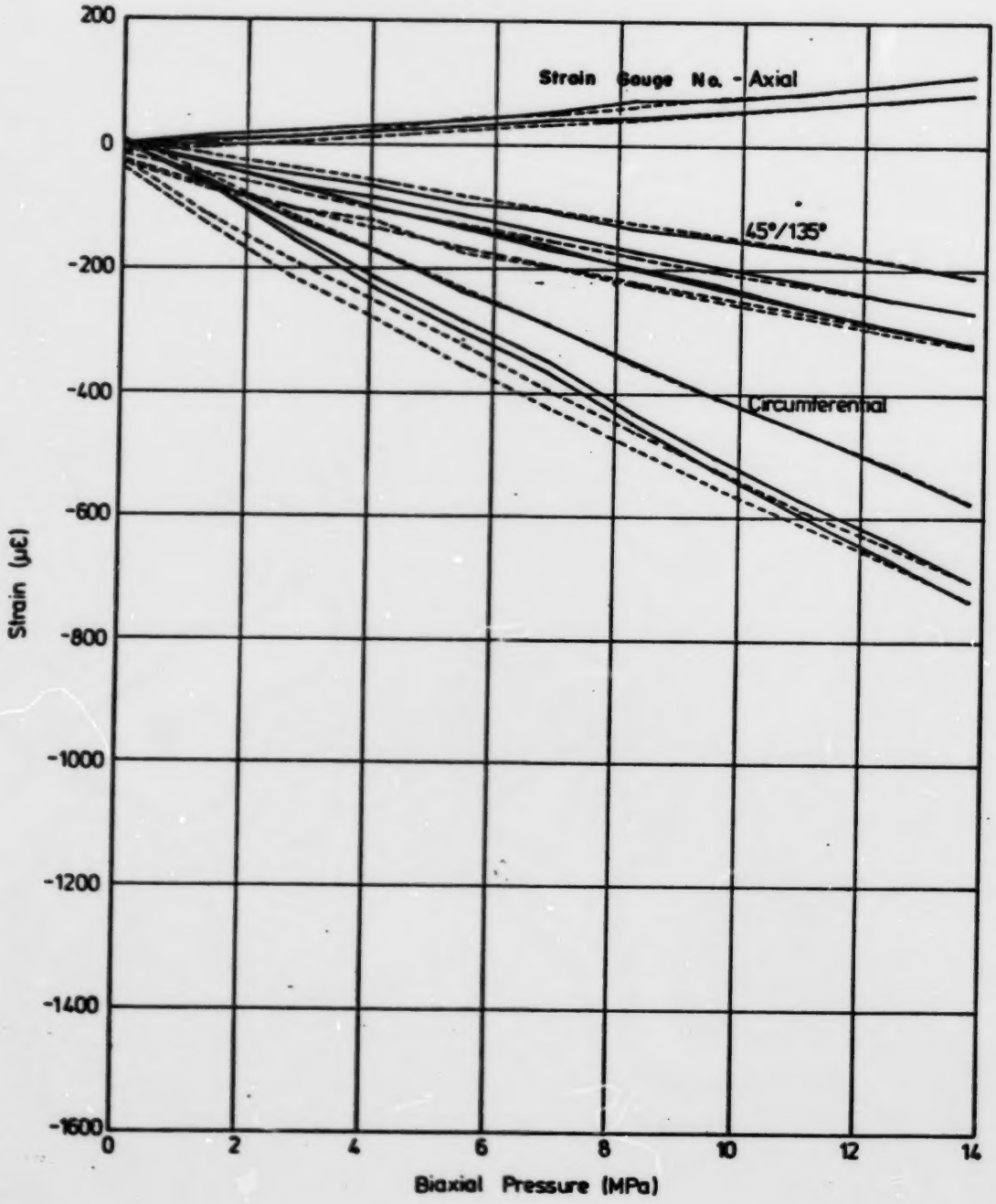
CSIRO TEST NO. 1
BIAXIAL TEST RESULTS

FIGURE 19



Date JULY 28,1983
Project 831-6014

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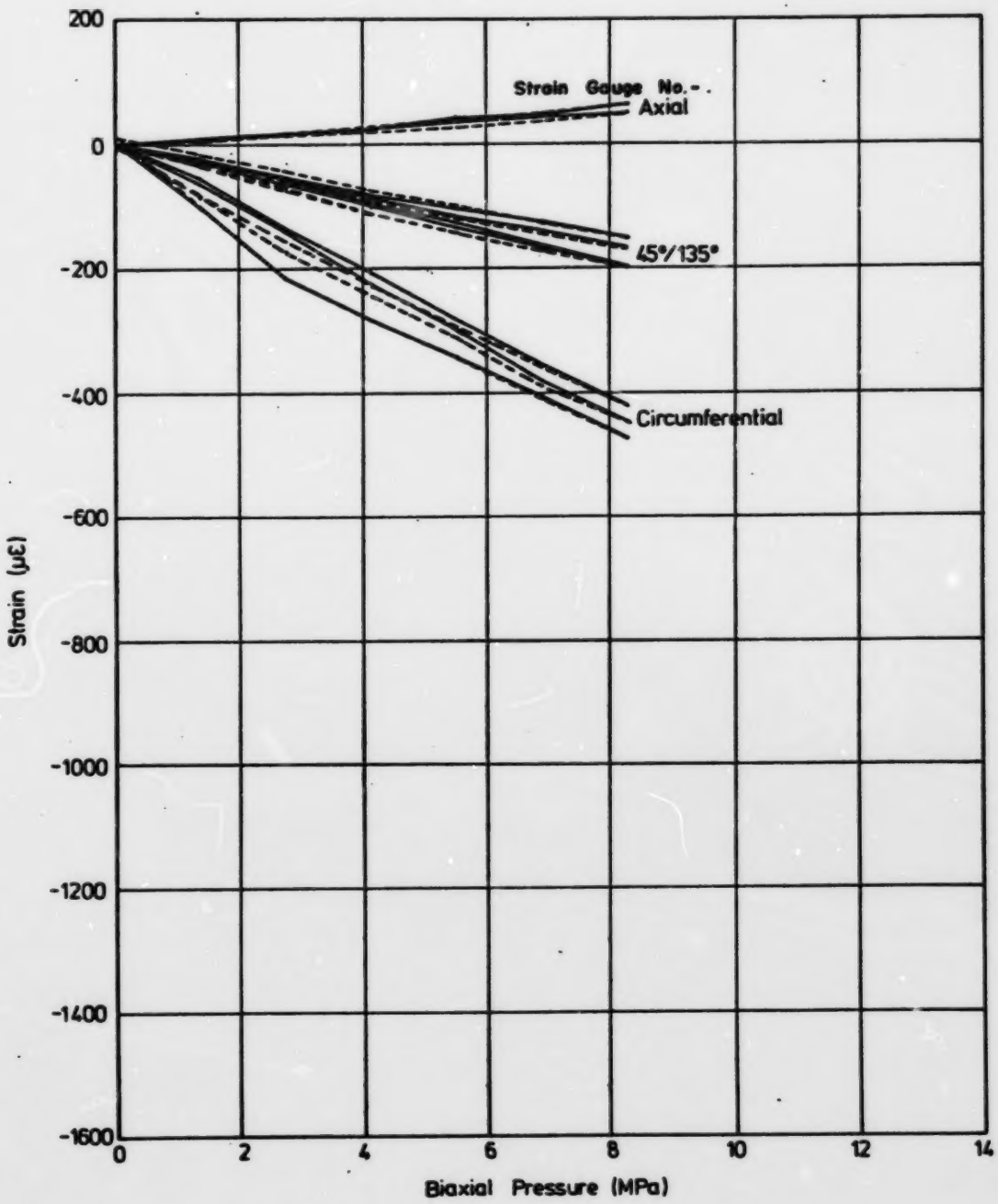
Drawn JLG
Chkd

CSIRO TEST NO. 1 (wet)
BIAXIAL TEST RESULTS

FIGURE 20



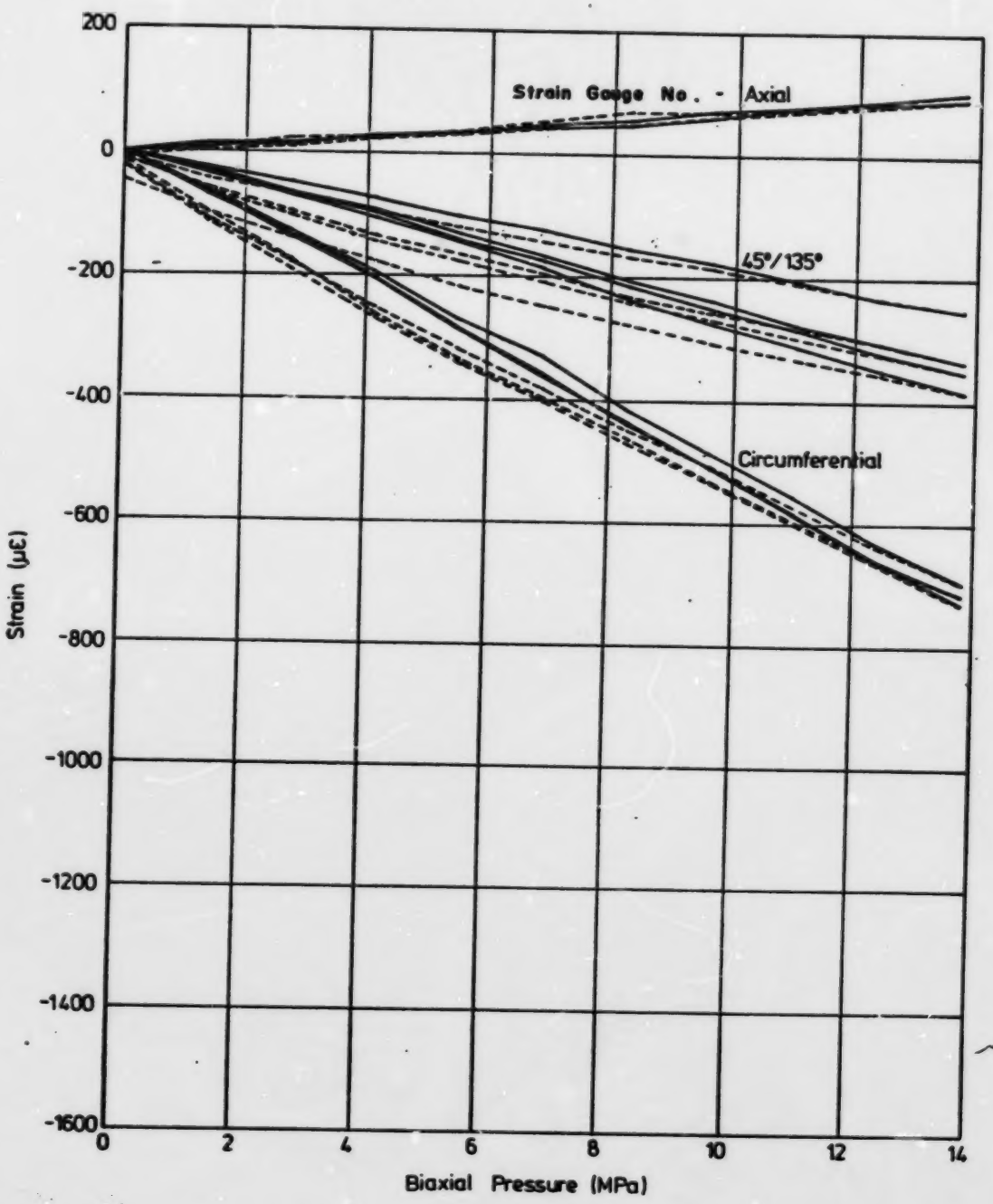
Date JULY 28, 1983
Project 831-6014

Golder Associates

Drawn JLG
Chkd

CSIRO TEST NO. 2
BIAXIAL TEST RESULTS

FIGURE 21



Date JULY 28, 1983
Project 831-6014

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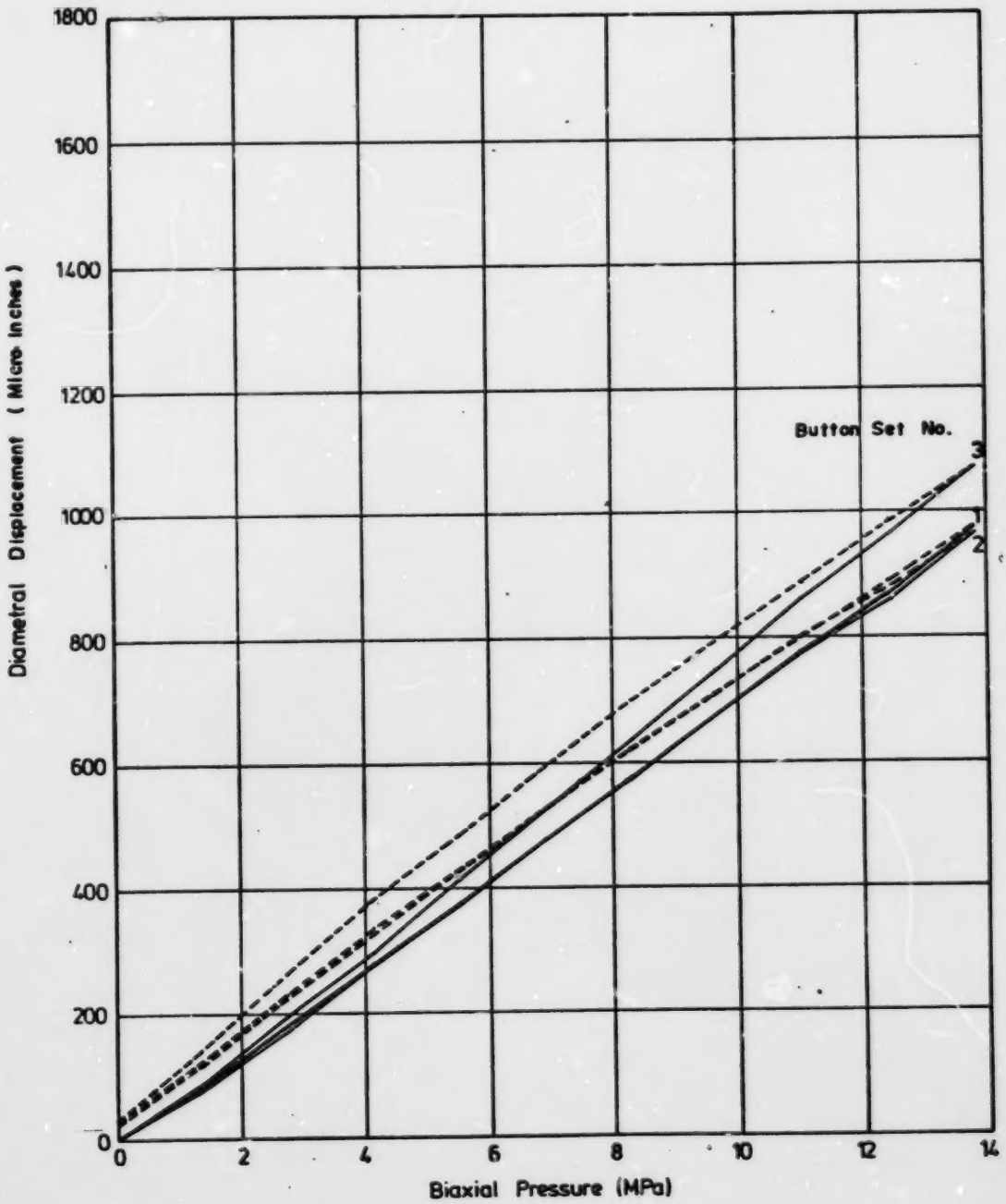
Drawn JLG
Chkd

USBM TEST NO. 1
BIAXIAL TEST RESULTS

FIGURE 22



Date JULY 28,1983
Project 831-6014

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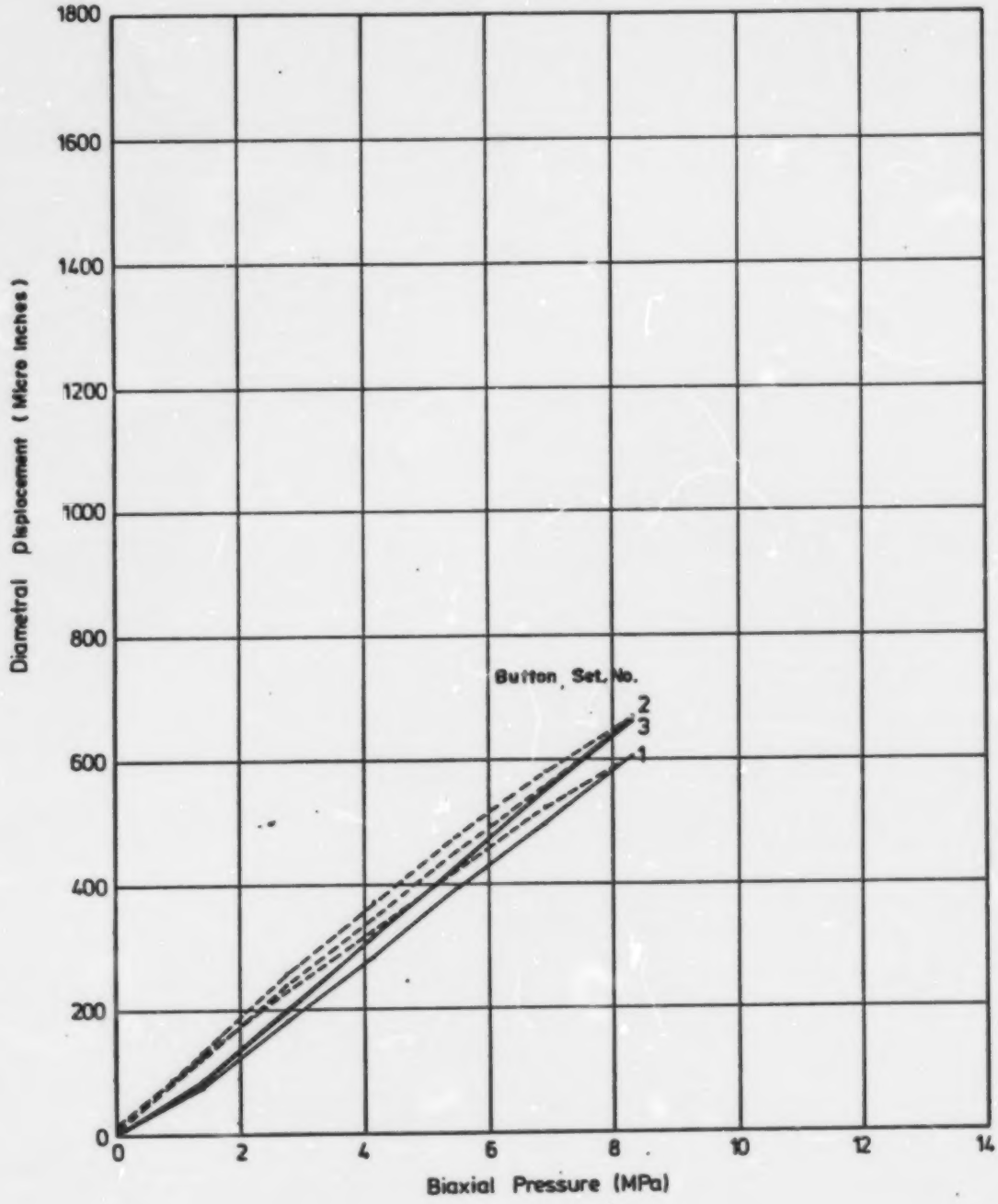
Drawn JLG
Chkd

USBM TEST NO. 1 (wet)
BIAXIAL TEST RESULTS

FIGURE 23



Date JULY 28, 1983
Project 831-6014

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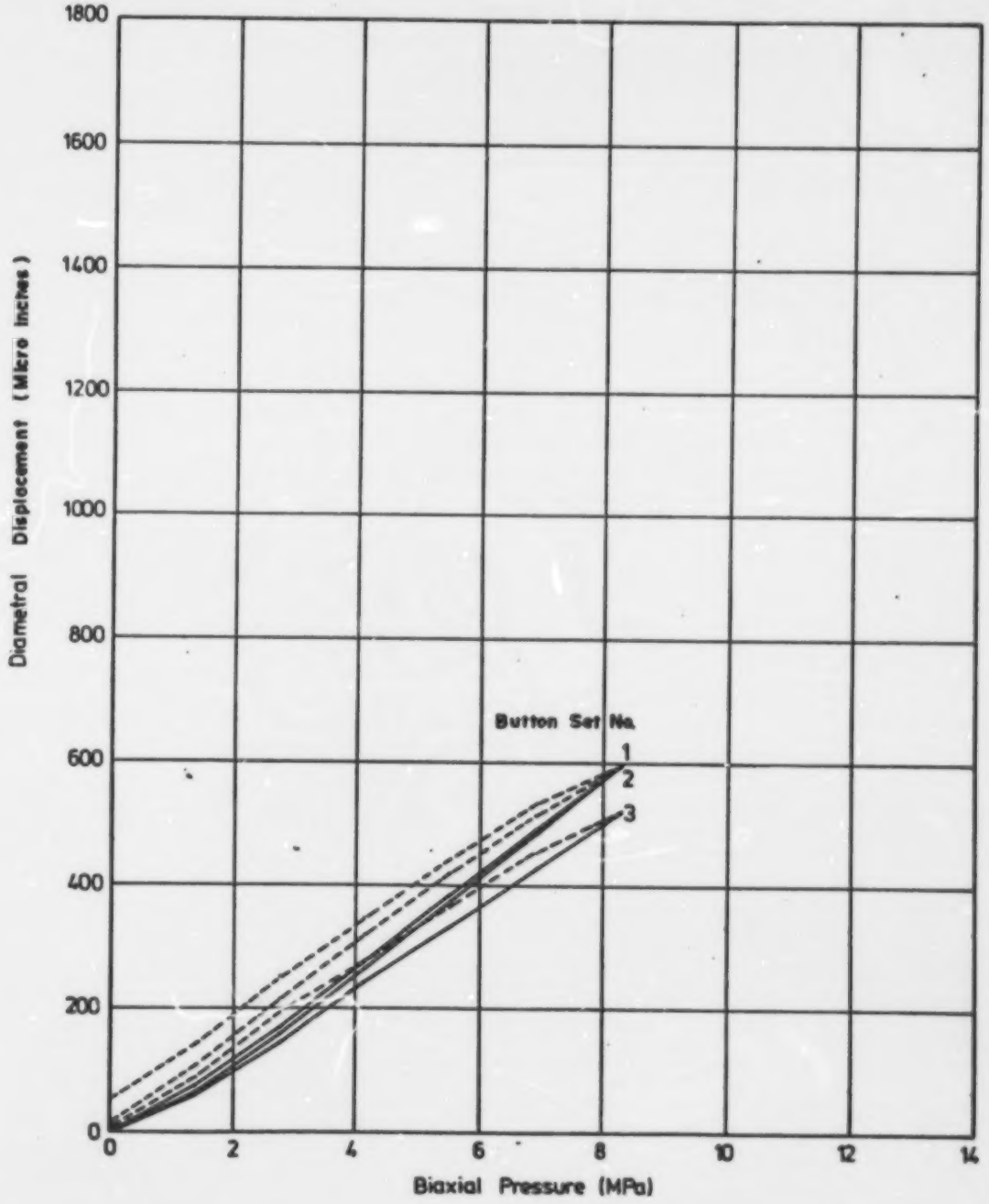
Chkd

USBM TEST NO. 2
BIAXIAL TEST RESULTS

FIGURE 24



Date JULY 28, 1983
Project 831-6014

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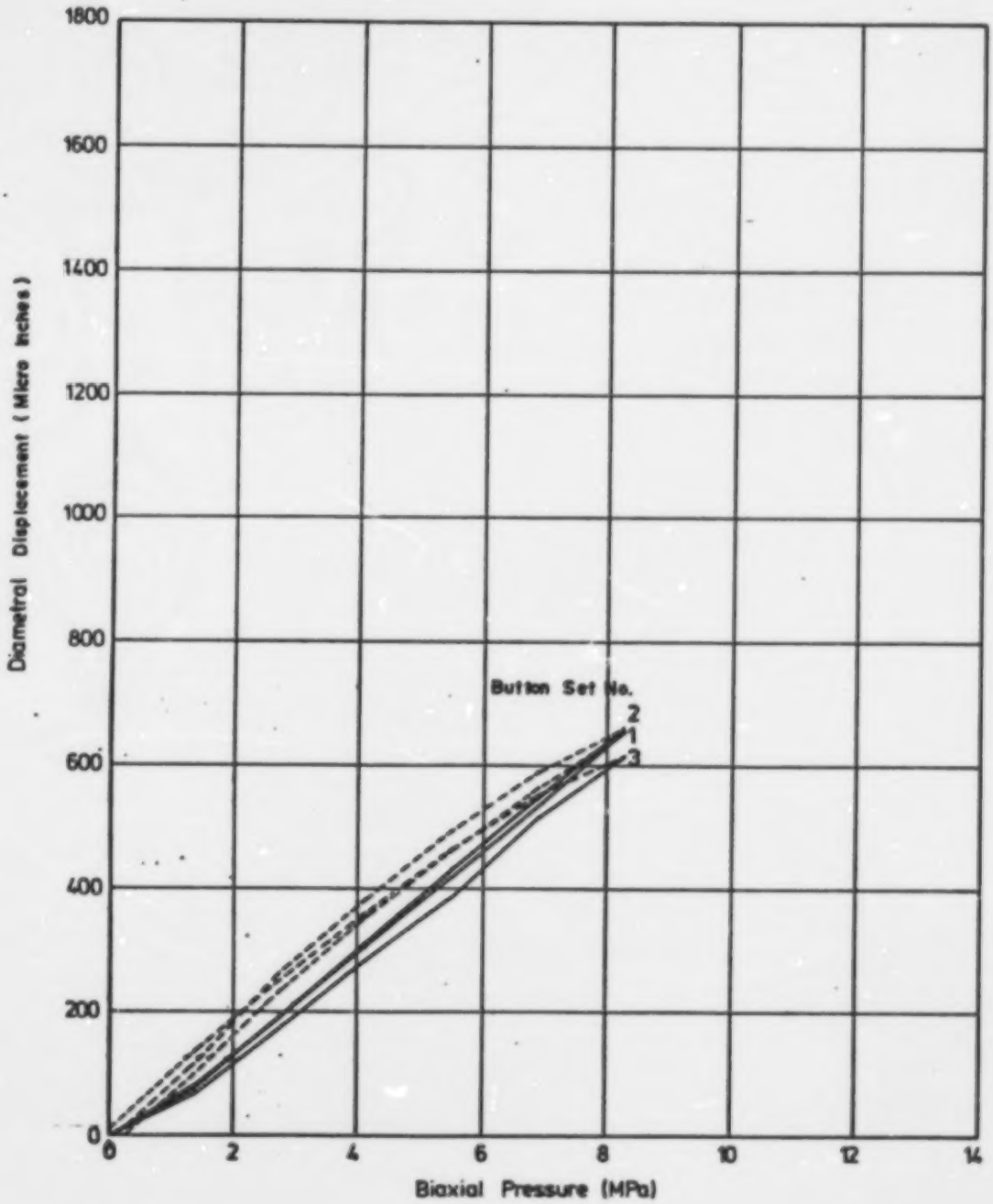
Drawn JLG
Chkd

USBM TEST NO. 2 (wet)
BIAXIAL TEST RESULTS

FIGURE 25



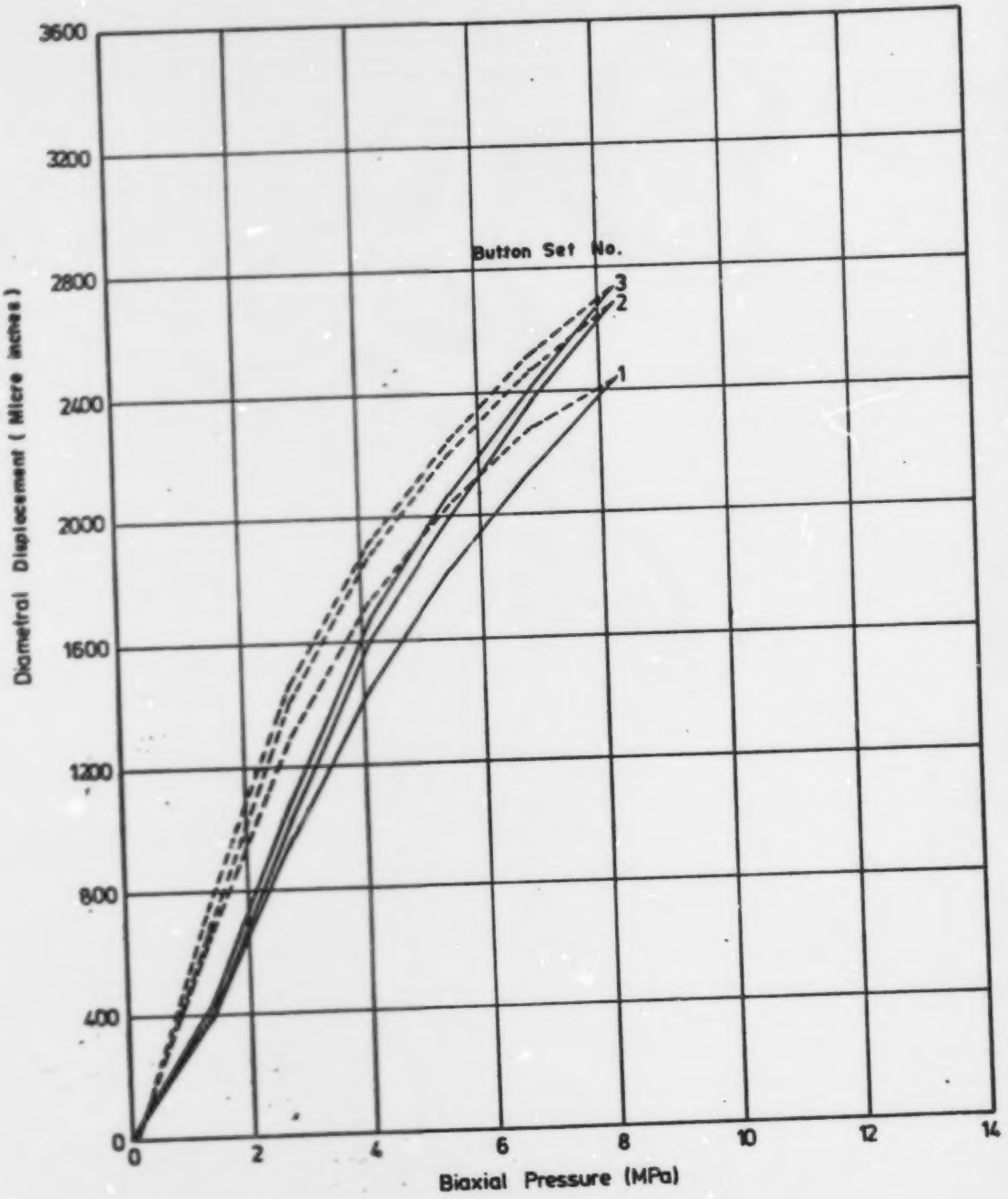
Date JULY 28, 1983
Project 831-6014

Golder Associates

Drawn JLG
Chkd

USBM TEST NO. 3 (wet)
BIAXIAL TEST RESULTS

FIGURE 26



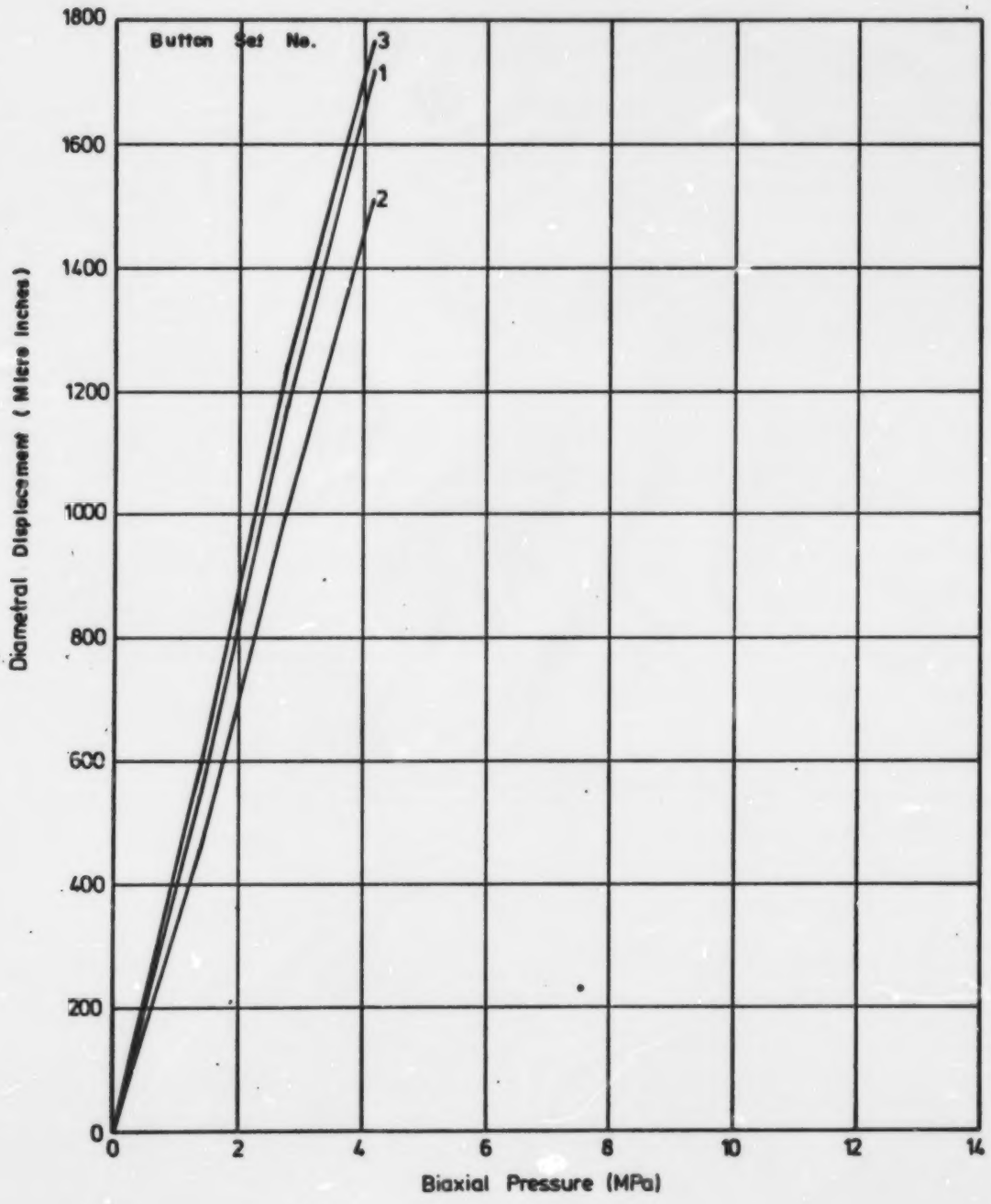
Date JULY 28,1983
Project 831-6014

Golder Associates

Drawn JLG
Chkd

USBM TEST NO. 4 (wet)
BIAXIAL TEST RESULTS

FIGURE 27



Date JULY 28, 1983
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Drawn JLG
Chkd CJ

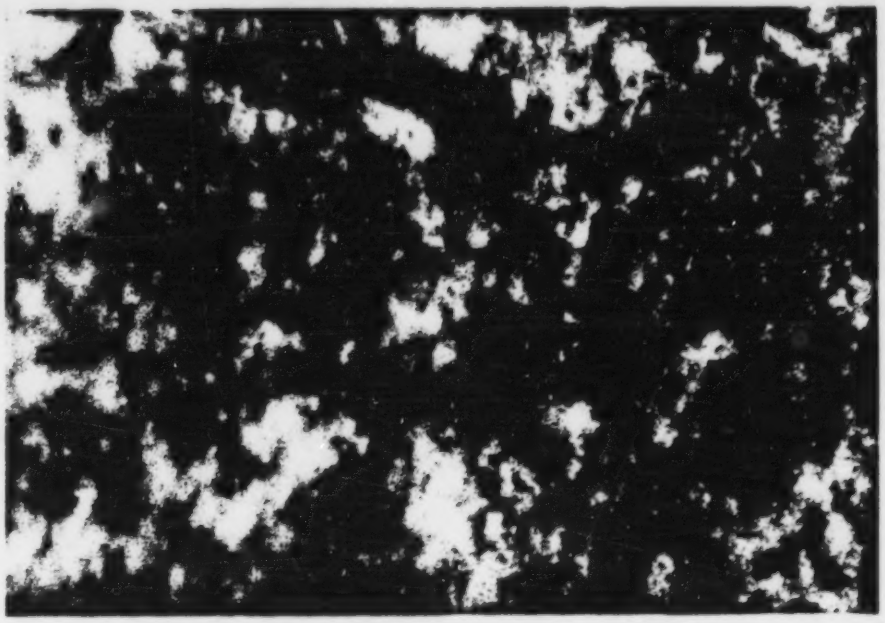


FIGURE 28 GRAIN SIZE OF OVERCORE SAMPLE
FROM CSIRO TEST NO. 2
(70 TIMES MAGNIFICATION)

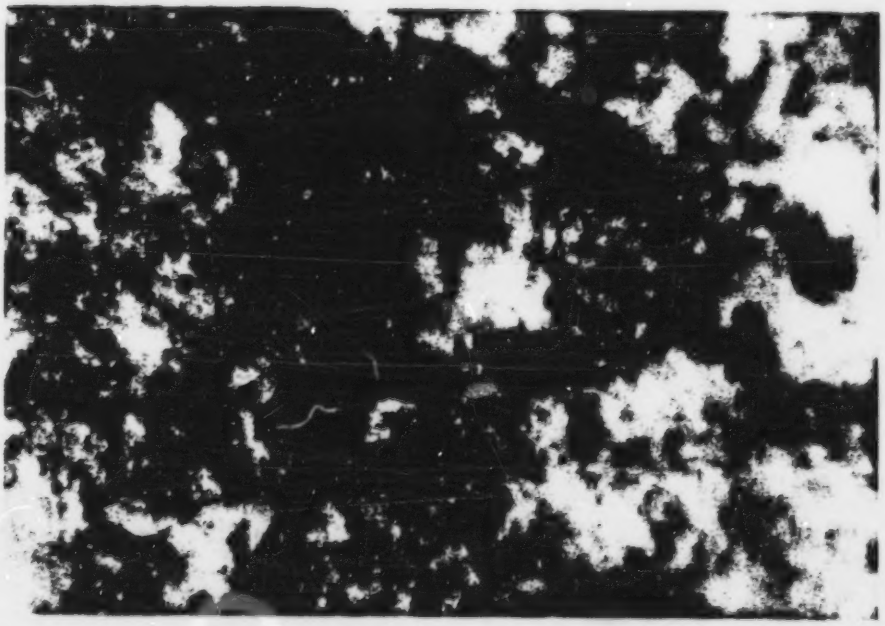
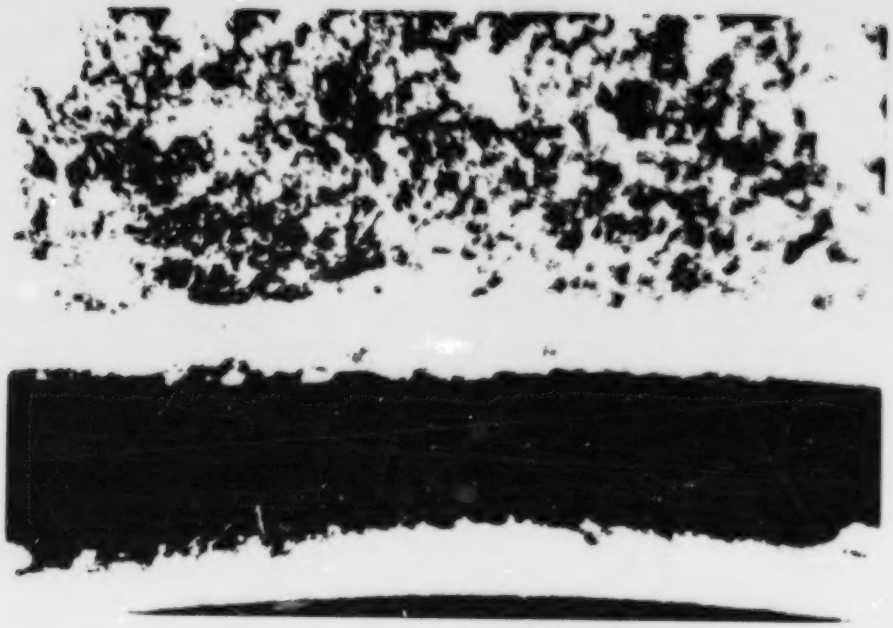
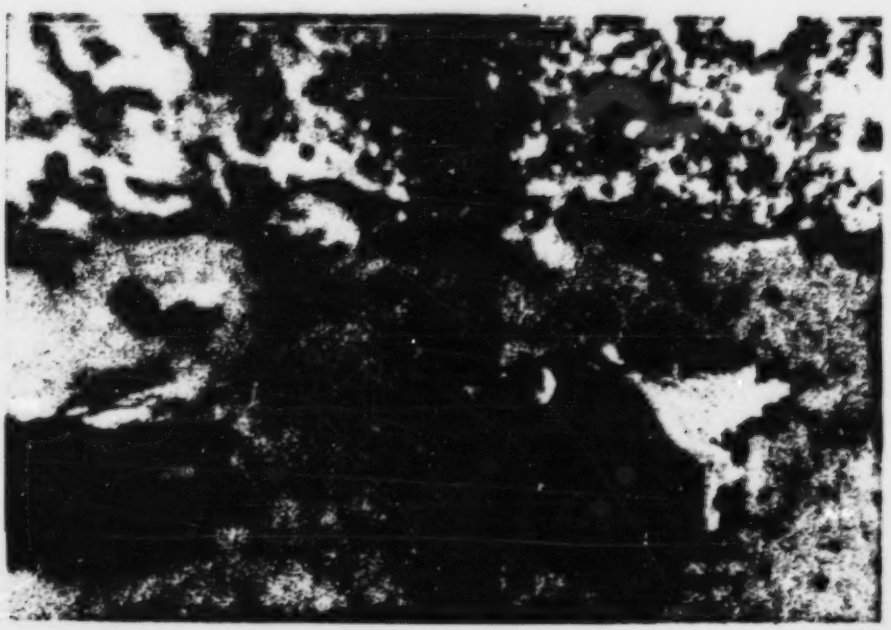


FIGURE 29 GRAIN SIZE OF OVERCORE SAMPLE
FROM CSIRO TEST NO. 3
(70 TIMES MAGNIFICATION)



a. CSIRO TEST NO. 1
(40 TIMES MAGNIFICATION)



b. CSIRO TEST NO. 3
(40 TIMES MAGNIFICATION)

FIGURE 30 DIFFERENCE IN BONDING OF CSIRO GAUGE TO PILOT HOLE IN CSIRO TEST NO. 1 AND 3

Volume

4

Energy, Mines and Resources Canada
CANMET
Canada Centre for Mineral and Energy Technology.

Énergie, Mines et Ressources Canada
Centre canadien de la technologie des minéraux et de l'énergie.

CANMET CONTRACT REPORT

CONTRACT REPORT NUMBER ISQ82-00233

No. 26SQ.23440-2-9159

MEASUREMENT AND ANALYSIS OF ROCK DEFORMATION AND SUPPORT SYSTEM RESPONSE IN THE DRILL AND BLAST AND BORED ACCESS DRIVAGES AT THE DONKIN-MORIEN PROJECT (UP-G198)

VOLUME IV - APPENDICES C, D & E

prepared by

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

Work on this project was conducted under the auspices of the Canada Centre for Mineral and Energy Technology, Energy, Mines and Resources Canada.

Canada

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

REPORT TO
CANMET

MEASUREMENT AND ANALYSIS OF ROCK DEFORMATION AND SUPPORT SYSTEM RESPONSE IN THE DRILL AND BLAST AND BORED ACCESS DRIVAGES AT THE DONKIN-MORIEN PROJECT (UP-G-198)

VOLUME IV - APPENDICES C, D AND E

VOLUME I - DATA REPORT
VOLUME II - ANALYSIS OF DATA
VOLUME III - APPENDICES A AND B
VOLUME IV - APPENDICES C, D AND E

508pp

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June 1985

831-6014

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VOLUME IV

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INSTRUMENTATION
DATA TABLES AND PLOTS

APPENDIX C-1

ROCK DISPLACEMENTS
EXTENSOMETER DATA AND PLOTS

June 1985

831-6n*4

Reduction of Displacement Data

The following extensometer data tables include instrument reference number which is designated by tunnel No., chainage and designation. For example: the reference number of the extensometer is designated as 2T925EA

where 2T - Tunnel No. 2
925 - Chainage along tunnel (m)
E - Extensometer
A - Location:
A - vertical up
B - horizontal west
C - horizontal east
D - vertical down

Included in each sheet are the date installed and Datum readings as the first reading column. The anchor numbers are shown designated as A1 (3 m)

where A1 - Anchor number
(3 m) - Depth from collar of hole

Extensometer Data

For each set of readings the date, time and chainage of the tunnel are shown as well as the raw data under the reading column, this reading is measured in inches. The Dif. mm column is the reduced reading in mm.

a) For rigid probe extensometers (with calibration)

$$\text{Dif. (mm)} = 25.4\ (r_1 - r_o + c_o - c_1)$$

b) For flexible sonic probe extensometers (no calibration)

$$\text{Dif. (mm)} = 25.4\ (r_1 - r_o)$$

where 25.4 = conversion inches to mm
r_1 = reading taken (in)
r_o = datum reading (in)
c_o = datum calibration reading (in)
c_1 = calibration at time of reading r_1 (in)

For all readings, positive values indicate displacement towards the tunnel opening.

Donkin-Marien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T925EA — Chainage 925 m
Date installed 01/04/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04	1.04	19.30	4.04	12.15	4.04	12.17	4.04	13.32	10.04	10.00
Tunnel ch.	925.08	925.08		944.72		944.72		944.72		1004.75	
A1 (3m)	4.18	4.18	.00	-	-	-	-	-	-	-	-
A2 (8.5m)	9.685	9.685	.00	8.952	-17.6	8.968	-17.2	8.955	-17.3	8.974	-17.6
Calibration	21.841	21.841		21.799		21.803		21.791		21.823	
Comments	Datum	Probe 127		Probe 132							

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04	4.05									
Tunnel ch.	925.08	1254.74									
A1 (3m)	4.18	-	-								
A2 (8.5m)	9.685	-	-								
Calibration	21.841										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T925EB — Chainage 925 m
Date installed 01/04/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04	1.04	19.30	4.04	11.35	4.04	12.45	10.04	10.00	16.04	
Tunnel ch.	925.08	925.08		944.72		944.72		1004.75		1062.52	
A1 (3m)	4.518	4.518	.00	-	-	3.686	-21.6	3.687	-21.6	3.685	-21.7
A2 (10m)	9.733	9.733	.00	8.96	-20.3	8.961	-20.1	8.963	-20	8.965	-20
A3 (21m)	15.166	15.166	.00	14.446	-18.9	14.44	-18.9	14.445	-18.8	14.445	-18.8
Calibration	21.915	21.915		21.94		21.935		21.933		21.935	
Comments	Datum	Probe 127									

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04	19.04		4.05		7.06	9.00	31.07	10.00	26.03	10.00
Tunnel ch.	925.08	1112.62		1254.74		1522.00		1835.00		3579.78	1985
A1 (3m)	4.518	3.684	-21.6	3.684	-21.6	3.684	-21.7	3.685	-21.7	3.685	-21.7
A2 (10m)	9.733	8.964	-20	8.963	-20	8.963	-20.1	8.965	-20.1	8.967	-20
A3 (21m)	15.166	14.445	-18.8	14.444	-18.8	14.444	-18.8	14.446	-18.9	14.445	-18.9
Calibration	21.915	21.933		21.933		21.935		21.938		21.937	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T925EC — Chainage 925 m
Date installed 01/04/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04	1.04	19.30	3.04	18.30	3.04	18.30	3.04	20.00	4.04	13.12
Tunnel ch.	925.08	925.08		931.13		931.13		934.00		944.72	
A1 (1.2m)	11.99	11.99	.00	12.005	1.372	11.998	.69	11.993	.46	11.983	.71
A2 (21m)	17.763	17.763	.00	17.835	2.819	17.819	1.91	17.819	1.80	17.816	2.24
Calibration	21.924	21.924		21.885		21.905		21.909		21.889	
Comments	Datum			Probe 127		Probe 132					

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04	16.04	17.30	19.04	19.00	4.05	10.00	7.06	9.00	31.07	10.00
Tunnel ch.	925.08	1062.52		1112.62		1254.74		1522.00		1835.00	
A1 (1.2m)	11.99	11.99	-.28	11.988	-.33	11.989	-.28	11.989	-.28	11.989	-.28
A2 (21m)	17.763	17.793	.48	17.793	.48	17.793	.51	17.795	.56	17.796	.58
Calibration	21.924	21.935		21.935		21.934		21.934		21.934	
Comments	Datum	Probe 133									

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T925EC — Chainage 925 m
Date installed 01/04/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04	26.03	10.00								
Tunnel ch.	925.08	3579.78	1985								
A1 (1.2m)	11.99	11.989	-.28								
A2 (21m)	17.763	17.801	.71								
Calibration	21.924	21.934									
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.04										
Tunnel ch.	925.08										
A1 (1.2m)	11.99										
A2 (21m)	17.763										
Calibration	21.924										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T920ED — Chainage 920 m
Date installed 02/04/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	2.04	2.04	13.00	2.04	19.00	2.04	19.00	2.04	21.45	2.04	22.00
Tunnel ch.	925.08	925.08		925.08		925.08		925.50		925.60	
A1 (3m)	5.961	5.961	.00	5.96	.08	5.946	.20	5.96	.56	5.961	.58
A2 (10m)	10.801	10.801	.00	10.803	.15	10.783	.13	10.793	.38	10.794	.41
A3 (19.5m)	15.952	15.952	.00	15.953	.13	15.926	-.08	15.942	.33	15.943	.36
Calibration	21.766	21.766		21.762		21.743		21.743		21.743	
Comments	Datum	Probe 127				Probe 125 installed					

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	2.04	2.04	22.15	2.04	22.30	2.04	22.45	2.04	23.00	2.04	23.20
Tunnel ch.	925.08	925.80		926.50		926.52		926.52		926.60	
A1 (3m)	5.961	5.961	.58	5.965	.69	5.967	.74	5.966	.71	5.968	.76
A2 (10m)	10.801	10.795	.43	10.798	.51	10.799	.53	10.798	.51	10.8	.56
A3 (19.5m)	15.952	15.944	.38	15.948	.48	15.95	.53	15.949	.51	15.95	.53
Calibration	21.766	21.743		21.743		21.743		21.743		21.743	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T920ED — Chainage 920 m
Date installed 02/04/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	2.04	2.04	23.30	3.04	.55	3.04	2.07	3.04	5.10	3.04	17.25
Tunnel ch.	925.08	926.80		928.26		929.53		929.53		930.90	
A1 (3m)	5.961	5.969	.79	5.986	1.22	5.989	1.30	6.006	1.75	6.041	2.64
A2 (10m)	10.801	10.801	.58	10.819	1.04	10.822	1.12	10.839	1.57	10.874	2.46
A3 (19.5m)	15.952	15.953	.61	15.97	1.04	15.973	1.12	15.989	1.55	16.025	2.46
Calibration	21.766	21.743		21.743		21.743		21.742		21.742	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	2.04	3.04	19.50	10.04	10.00	19.04	19.00	4.05	10.00	7.06	9.00
Tunnel ch.	925.08	932.61		1004.75		1112.62		1254.74		1522.00	
A1 (3m)	5.961	6.067	3.30	6.224	7.37	6.242	7.80	6.257	8.18	6.274	8.59
A2 (10m)	10.801	10.9	3.12	11.056	7.16	11.078	7.70	11.092	8.05	11.108	8.43
A3 (19.5m)	15.952	16.052	3.15	16.214	7.34	16.228	7.67	16.239	7.95	16.261	8.48
Calibration	21.766	21.742		21.739		21.74		21.74		21.741	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T920ED — Chainage 920 m
Date installed 02/04/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	2.04	31.07	10.00	26.03	10.00						
Tunnel ch.	925.08	1835.00	1984	3579.78	1985						
A1 (3m)	5.961	6.29	8.97	6.327	9.96						
A2 (10m)	10.801	11.125	8.84	11.17	10.03						
A3 (19.5m)	15.952	16.279	8.92	16.325	10.13						
Calibration	21.766	21.742		21.74							
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	2.04										
Tunnel ch.	925.08										
A1 (3m)	5.961										
A2 (10m)	10.801										
A3 (19.5m)	15.952										
Calibration	21.766										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1428EC — Chainage 1428 m
Date installed 26/05/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05	26.05	18.00	28.05	16.00	31.05	14.45	31.05	14.45	4.06	15.10
Tunnel ch.	1427.97	1427.97		1427.97		1474.47		1474.47		1510.35	
A1 (3m)	5.481	5.481	.00	5.481	.00	7.725	51.59	8.333	51.69	4.543	48.34
A2 (10m)	10.756	10.756	.00	10.756	.00	12.809	46.74	13.418	46.86	7.97	1.40
A3 (21m)	15.336	15.336	.00	15.336	.00	17.545	50.70	18.157	50.90	13.021	13.36
Calibration	21.903	21.903		21.903		22.116		22.72		19.062	
Comments	Datum	Probe 127									

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05	7.06	10.30	7.06	10.30	12.06	9.00	28.06	21.00	31.07	10.00
Tunnel ch.	1427.97	1522.35		1522.35		1522.35		1627.78		1835.00	
A1 (3m)	5.481	4.478	45.57	5.063	45.64	5.06	44.63	5.054	43.15	5.058	42.16
A2 (10m)	10.756	7.973	.36	8.561	.51	8.565	-.33	8.56	-1.78	8.565	-2.74
A3 (21m)	15.336	13.046	12.88	13.635	13.06	13.642	12.29	13.666	11.58	13.695	11.23
Calibration	21.903	19.106		19.688		19.725		19.777		19.82	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1428EA — Chainage 1428 m
Date installed 26/05/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05	26.05	18.00	28.05	16.00	29.05	15.30	29.05	17.00	29.05	19.00
Tunnel ch.	1427.97	1427.97		1427.97		1439.00		1439.97		1440.80	
A1 (3m)	4.961	4.961	.00	4.961	.00	6.456	38.00	6.508	39.32	6.531	39.85
A2 (10m)	10.373	10.373	.00	10.373	.00	11.979	40.82	12.126	44.55	12.172	45.67
A3 (21m)	15.865	15.865	.00	15.865	.00	17.499	41.53	17.604	44.20	17.621	44.58
Calibration	21.871	21.871		21.871		21.87		21.87		21.872	
Comments	Datum	Probe 127									

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05	29.05	21.00	31.05	14.45	4.06	15.10	7.06	10.30	12.06	9.00
Tunnel ch.	1427.97	1443.97		1474.47		1510.35		1522.35		1522.35	
A1 (3m)	4.961	6.69	43.92	7.146	54.99	7.327	59.51	7.395	61.16	7.457	62.61
A2 (10m)	10.373	12.222	46.96	12.735	59.49	12.918	64.06	12.989	65.79	13.052	67.26
A3 (21m)	15.865	17.732	47.42	18.241	59.84	18.426	64.47	18.494	66.12	18.555	67.54
Calibration	21.871	21.871		21.891		21.894		21.897		21.902	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1428EA — Chainage 1428 m
Date installed 26/05/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05	28.06	21.00	31.07	10.00	26.03	10.00				
Tunnel ch.	1427.97	1627.78		1835.00	1984	3579.78	1985				
A1 (3m)	4.961	7.581	65.76	7.684	68.38	7.83	72.09				
A2 (10m)	10.373	13.177	70.43	13.282	73.10	13.438	77.06				
A3 (21m)	15.865	18.681	70.74	18.788	73.46	18.944	77.42				
Calibration	21.871	21.902		21.902		21.902					
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05										
Tunnel ch.	1427.97										
A1 (3m)	4.961										
A2 (10m)	10.373										
A3 (21m)	15.865										
Calibration	21.871										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1428EB — Chainage 1428 m
Date installed 26/05/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05	26.05	18.00								
Tunnel ch.	1427.97	1427.97									
A1 (3m)	5.653	5.653	.00								
A2 (10m)	11.094	11.094	.00								
A3 (21m)	16.924	16.924	.00								
Calibration	21.928	21.928									
Comments	Datum	Probe 127									

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05										
Tunnel ch.	1427.97										
A1 (3m)	5.653										
A2 (10m)	11.094										
A3 (21m)	16.924										
Calibration	21.928										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1428EC — Chainage 1428 m
Date installed 26/05/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05	26.03	10.00								
Tunnel ch.	1427.97	3579.78	1985								
A1 (3m)	5.481	4.673	18.52								
A2 (10m)	10.756	8.751	-11.9								
A3 (21m)	15.336	14.108	7.85								
Calibration	21.903	20.366									
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	26.05										
Tunnel ch.	1427.97										
A1 (3m)	5.481										
A2 (10m)	10.756										
A3 (19.5m)	15.336										
Calibration	21.903										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1420ED — Chainage 1420 m
Date installed 28/05/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	28.05	28.05	11.00	28.05	15.15	28.05	17.10	28.05	18.34	28.05	19.45
Tunnel ch.	1427.97	1427.97		1427.97		1428.42		1429.47		1430.97	
A1 (3m)	10.66	10.66	.00	10.696	.91	10.725	1.65	10.764	2.64	10.815	3.94
A2 (10m)	14.64	14.64	.00	14.672	.81	14.701	1.55	14.74	2.54	14.796	3.96
A3 (21m)	19.486	19.486	.00	19.535	1.24	19.559	1.85	19.597	2.82	19.646	4.06
Comments	Datum	Probe 127									

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	28.05	28.05	20.15	29.05	17.00	29.05	19.00	29.05	21.00	31.05	14.45
Tunnel ch.	1427.97	1432.47		1439.97		1440.80		1443.97		1474.47	
A1 (3m)	10.66	10.846	4.72	11.116	11.58	11.116	11.58	11.115	11.56	11.111	11.46
A2 (10m)	14.64	14.83	4.83	15.166	13.36	15.215	14.61	15.251	15.52	15.69	26.67
A3 (21m)	19.486	19.677	4.85	20.021	13.59	20.074	14.94	20.11	15.85	20.481	25.27
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1420ED — Chainage 1420 m
Date installed 28/05/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	28.05	4.06	15.10	7.06	10.30	12.06	9.00	28.06	21.00	31.07	10.00
Tunnel ch.	1427.97	1510.35		1522.35		1522.35				1835.00	
A1 (3m)	10.66	11.111	11.46	11.111	11.46	11.113	11.51	11.114	11.53	11.114	11.53
A2 (10m)	14.64	15.911	32.28	15.911	32.28	16.053	35.89	16.186	39.27	16.299	42.14
A3 (21m)	19.486	20.671	30.10	20.671	30.10	20.798	33.32	20.918	36.37	21.023	39.04
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	28.05	26.03	10.00								
Tunnel ch.	1427.97	3579.78	1985								
A1 (3m)	10.66	11.114	11.53								
A2 (10m)	14.64	16.513	47.57								
A3 (21m)	19.486	21.226	44.20								
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T1889EA — Chainage 1889 m
Date installed 06/08/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	7.08	7.08	.33	7.08	2.33	7.08	3.25	7.08	4.55	7.08	6.35
Tunnel ch.	1896.00	1896.00		1896.50		1897.70		1898.70		1900.20	
A1 (0.6m)	18.361	18.361	.00	18.432	1.00	18.44	2.01	18.478	2.97	18.561	5.08
A2 (1.2m)	45.364	45.364	.00	45.511	3.73	45.537	4.39	45.605	6.12	45.713	8.86
A3 (1.5m)	55.182	55.182	.00	55.349	4.24	55.387	5.21	55.456	6.96	55.565	9.73
A4 (1.8m)	68.553	68.553	.00	68.721	4.27	68.756	5.16	68.827	6.96	68.94	9.83
A5 (2.9m)	109.989	109.989	.00	110.156	4.24	110.192	5.16	110.262	6.93	110.378	9.88
A6 (3.8m)	147.181	147.181	.00	147.348	4.24	147.382	5.11	147.454	6.93	147.567	9.80
A7 (4.6m)	178.375	178.375	.00	178.45	1.91	178.575	5.08	178.645	6.86	178.76	9.78
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	7.08	17.08	21.00	22.08	15.00						
Tunnel ch.	1896.00	2003.37		2033.18							
A1 (0.6m)	18.361	18.835	12.04	18.846	12.32						
A2 (1.2m)	45.364	46.34	24.79	46.383	25.88						
A3 (1.5m)	55.182	56.325	29.03	56.375	30.30						
A4 (1.8m)	68.553	69.77	30.91	69.833	32.51						
A5 (2.9m)	109.989	111.358	34.77	111.445	36.98						
A6 (3.8m)	147.181	148.56	35.03	148.649	37.29						
A7 (4.6m)	178.375	179.762	35.23	179.849	37.44						
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Dankin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T1889EB — Chainage 1889 m
Date installed 06/08/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	7.08	7.08	.30	7.08	1.50	7.08	3.15	7.08	5.05	7.08	6.25
Tunnel ch.	1896.00	1896.00		1896.50		1897.50		1898.70		1900.20	
A1 (0.5m)	14.479	14.479	.00	14.474	-.13	14.476	-.08	14.481	.05	14.476	-.08
A2 (0.9m)	32.276	32.276	.00	32.276	.00	32.272	-.10	32.28	.10	32.278	.05
A3 (1.5m)	53.625	53.625	.00	53.622	-.08	53.621	-.10	53.622	-.08	53.624	-.03
A4 (1.9m)	70.162	70.162	.00	70.16	-.05	70.164	.05	70.174	.30	70.176	.36
A5 (2.8m)	107.571	107.571	.00	107.575	.10	107.576	.13	107.587	.41	107.594	.58
A6 (3.7m)	143.946	143.946	.00	143.951	.13	143.952	.15	143.962	.41	143.972	.66
A7 (4.8m)	184.301	184.301	.00	184.306	.13	184.31	.23	184.321	.51	184.326	.64
A8 (5.7m)	220.661	220.661	.00	220.666	.13	220.669	.20	220.679	.46	220.695	.86
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	7.08	7.08	10.51	27.08	14.00						
Tunnel ch.	2896.00	1901.70		2085.00							
A1 (0.5m)	14.479	14.491	.30	14.475	-.10						
A2 (0.9m)	32.276	32.3	.61	32.28	.10						
A3 (1.5m)	53.625	53.661	.91	53.629	.10						
A4 (1.9m)	70.162	70.221	1.50	70.217	1.40						
A5 (2.8m)	107.571	107.643	1.83	107.639	1.73						
A6 (3.7m)	143.946	143.996	1.27	144.074	3.25						
A7 (4.8m)	184.301	184.352	1.30	184.375	1.88						
A8 (5.7m)	220.661	-	-	220.735	1.88						
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T1889EC — Chainage 1889 m
Date installed 06/08/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	6.08	6.08	22.18	7.08	.45	7.08	2.00	7.08	3.30	7.08	5.40
Tunnel ch.	1896.00	1896.00		1896.00		1896.50		1897.70		1899.70	
A1 (0.5m)	14.87	14.87	.00	14.87	.00	14.879	.23	14.874	.10	14.872	.05
A2 (0.9m)	31.133	31.133	.00	31.137	.10	31.147	.36	31.134	.03	31.149	.41
A3 (1.5m)	53.42	53.42	.00	53.423	.08	53.45	.76	53.424	.10	53.453	.84
A4 (1.8m)	65.207	65.207	.00	65.21	.08	65.237	.76	65.21	.08	65.24	.84
A5 (2.6m)	100.185	100.185	.00	100.197	.30	100.21	.64	100.19	.13	100.211	.66
A6 (4.8m)	186.722	186.722	.00	186.729	.18	186.736	.36	186.744	.56	186.751	.74
A7 (5.2m)	201.325	201.325	.00	201.337	.30	201.339	.36	201.346	.53	201.353	.71
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	6.08	7.08	6.50	7.08	14.45						
Tunnel ch.	2896.00	1901.00		1903.20							
A1 (0.5m)	14.87	14.87	.00	14.874	.10						
A2 (0.9m)	31.133	31.135	.05	31.134	.03						
A3 (1.5m)	53.42	53.427	.18	53.426	.15						
A4 (1.8m)	65.207	65.211	.10	65.211	.10						
A5 (2.6m)	100.185	100.192	.18	100.192	.18						
A6 (4.8m)	186.722	186.749	.69	186.762	1.02						
A7 (5.2m)	201.325	201.356	.79	201.364	.99						
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 2T1881ED — Chainage 1881 m
Date installed 06/08/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	6.08	6.08	22.18	7.08	.50	7.08	2.40	7.08	3.40	7.08	5.10
Tunnel ch.	1896.00	1896.00		1896.00		1896.50		1897.70		1899.00	
A1 (3m)	4.682	4.682	.00	4.712	.74	4.734	1.30	4.746	1.63	4.764	2.06
A2 (10m)	9.993	9.993	.00	10.024	.76	10.049	1.40	10.061	1.73	10.08	2.18
A3 (21m)	15.422	15.422	.00	15.45	.69	15.474	1.30	15.486	1.63	15.504	2.06
Calibration	21.813	21.813		21.814		21.814		21.813		21.814	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	6.08	7.08	6.55	7.08	11.38	13.08	19.00	27.08	15.00	26.03	10.00
Tunnel ch.	1896.00	1901.50		1901.70		1962.70		2085.00		3579.78	1985
A1 (3m)	4.682	4.783	2.51	4.806	3.10	5.06	9.40	5.224	13.56	5.842	29.13
A2 (10m)	9.993	10.099	2.64	10.124	3.28	10.408	10.34	10.631	16.00	11.307	33.05
A3 (21m)	15.422	15.523	2.51	15.546	3.10	15.803	9.47	16.018	14.94	16.655	30.99
Calibration	21.813	21.815		21.815		21.821		21.821		21.826	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2263EA
Date installed 10/09/84 Tunnel No. 2

Chainage 2263 m
Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.09	10.09	13.15	10.09	22.25	10.09	23.00	10.09	23.20	11.09	1.30
Tunnel ch.	2264.00	2264.00		2270.28		2270.50		2271.00		2274.80	
A1 (0.5m)	18.78	18.78	.00	18.781	.03	18.788	.20	18.787	.18	18.785	.13
A2 (1.0m)	36.934	36.934	.00	36.943	.23	36.94	.15	36.94	.15	36.941	.18
A3 (1.4m)	54.182	54.182	.00	54.211	.74	54.212	.76	54.212	.76	54.217	.89
A4 (1.8m)	68.532	68.532	.00	68.586	1.37	68.591	1.50	68.589	1.45	68.595	1.60
A5 (3.0m)	114.003	114.003	.00	114.087	2.13	114.092	2.26	114.092	2.26	114.098	2.41
A6 (3.8m)	146.036	146.036	.00	146.167	3.33	146.166	3.30	146.166	3.30	146.172	3.45
A7 (4.8m)	189.012	189.012	.00	189.136	3.15	189.136	3.15	189.139	3.23	189.145	3.38
A8 (5.8m)	223.06	223.06	.00	223.186	3.20	223.189	3.28	223.207	3.73	223.199	3.53
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.09	11.09	2.00	11.09	2.30	11.09	3.00	11.09	3.30	11.09	4.00
Tunnel ch.	2264.00	2275.70		2276.00		2276.74		2277.20		2277.74	
A1 (0.5m)	18.78	18.786	.15	18.784	.10	18.784	.10	18.786	.15	18.789	.23
A2 (1.0m)	36.934	36.942	.20	36.943	.23	36.943	.23	36.944	.25	36.958	.61
A3 (1.4m)	54.182	54.218	.91	54.219	.94	54.219	.94	54.22	.97	54.237	1.40
A4 (1.8m)	68.532	68.594	1.57	68.593	1.55	68.595	1.60	68.597	1.65	68.61	1.98
A5 (3.0m)	114.003	114.098	2.41	114.103	2.54	114.103	2.54	114.104	2.57	114.119	2.95
A6 (3.8m)	146.036	146.172	3.45	146.175	3.53	146.176	3.56	146.179	3.63	146.189	3.89
A7 (4.9m)	189.012	189.145	3.38	189.148	3.45	189.147	3.43	189.151	3.53	189.162	3.81
A8 (5.8m)	223.06	223.198	3.51	223.2	3.56	223.2	3.56	223.203	3.63	223.219	4.04
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2263EA — Chainage 2263 m
Date installed 10/09/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.09	11.09	4.30	11.09	5.00	11.09	5.30	11.09	6.00	11.09	6.30
Tunnel ch.	2264.00	2277.74		2277.74		2278.74		2278.80		2279.70	
A1 (0.5m)	18.78	18.802	.56	18.822	1.07	18.831	1.30	18.839	1.50	18.851	1.80
A2 (1.0m)	36.934	36.964	.76	36.995	1.55	37.005	1.80	37.031	2.46	37.038	2.64
A3 (1.4m)	54.182	54.248	1.68	54.29	2.74	54.309	3.23	54.342	4.06	54.354	4.37
A4 (1.8m)	68.532	68.625	2.36	68.666	3.40	68.685	3.89	68.706	4.42	68.725	4.90
A5 (3.0m)	114.003	114.139	3.45	114.174	4.34	114.191	4.78	114.218	5.46	114.232	5.82
A6 (3.8m)	146.036	146.208	4.37	146.247	5.36	146.263	5.77	146.287	6.38	146.337	7.65
A7 (4.8m)	189.012	189.182	4.32	189.219	5.26	189.234	5.64	189.253	6.12	189.275	6.68
A8 (5.8m)	223.06	223.227	4.24	223.267	5.26	223.284	5.69	223.307	6.27	223.324	6.71
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.09	11.09	7.00	11.09	7.30	12.09	2.00	13.09	1.00	14.09	2.00
Tunnel ch.	2264.00	2279.80		2280.20		2288.74		2309.50		2333.74	
A1 (0.5m)	18.78	18.864	2.13	18.875	2.41	18.94	4.06	18.975	4.95	18.985	5.21
A2 (1.0m)	36.934	37.069	3.43	37.084	3.81	37.228	7.47	37.325	9.93	37.362	10.87
A3 (1.4m)	54.182	54.388	5.23	54.417	5.97	54.64	11.63	54.813	16.03	54.884	17.83
A4 (1.8m)	68.532	68.759	5.77	68.791	6.58	69.012	12.19	69.18	16.46	69.251	18.26
A5 (3.0m)	114.003	114.264	6.63	114.295	7.42	114.512	12.93	114.717	18.14	114.793	20.07
A6 (3.8m)	146.036	146.371	8.51	146.406	9.40	146.616	14.73	146.769	18.62	146.834	20.27
A7 (4.9m)	189.012	189.307	7.49	189.339	8.31	189.555	13.79	189.74	18.49	189.813	20.35
A8 (5.8m)	223.06	223.358	7.57	223.388	8.33	223.604	13.82	223.785	18.42	223.867	20.50
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2263EA — Chainage 2263 m
Date installed 10/09/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.09	15.09	2.00	17.09	14.00	18.09	14.00	21.09	15.00	24.09	11.00
Tunnel ch.	2264.00	2348.00		2351.70		2370.15		2413.15		2427.25	
A1 (0.5m)	18.78	18.99	5.33	19.011	5.87	19.014	5.94	19.022	6.15	19.028	6.30
A2 (1.0m)	36.934	37.374	11.18	37.425	12.47	37.435	12.73	37.456	13.26	37.482	13.92
A3 (1.4m)	54.182	54.912	18.54	54.988	20.47	55.006	20.93	55.043	21.87	55.075	22.68
A4 (1.8m)	68.532	69.283	19.08	69.354	20.88	69.37	21.29	69.409	22.28	69.439	23.04
A5 (3.0m)	114.003	114.821	20.78	114.904	22.89	114.92	23.29	114.966	24.46	114.998	25.27
A6 (3.8m)	146.036	146.872	21.23	146.956	23.37	146.966	23.62	147.018	24.94	147.041	25.53
A7 (4.8m)	189.012	189.92	23.06	189.93	23.32	189.945	23.70	189.993	24.92	190.02	25.60
A8 (5.8m)	223.06	223.886	20.98	223.978	23.32	223.995	23.75	224.042	24.94	224.068	25.60
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.09										
Tunnel ch.	2264.00										
A1 (0.5m)	18.78										
A2 (1.0m)	36.934										
A3 (1.4m)	54.182										
A4 (1.8m)	68.532										
A5 (3.0m)	114.003										
A6 (3.8m)	146.036										
A7 (4.9m)	189.012										
A8 (5.8m)	223.06										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2433EA — Chainage 2433 m
Date installed 27/09/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	27.09	27.09	12.30	2.10	2.00	3.10	17.00	4.10	15.40	5.10	16.45
Tunnel ch.	2474.00	2474.00		2474.81		2476.35		2495.37		2519.40	
A1 (0.3m)	9.038	9.038	.00	9.197	4.04	9.223	4.70	9.219	4.60	9.244	5.23
A2 (0.9m)	31.973	31.973	.00	32.239	6.76	32.305	8.43	32.312	8.61	32.351	9.60
A3 (1.4m)	49.252	49.252	.00	49.66	10.36	49.781	13.44	49.81	14.17	49.852	15.24
A4 (1.8m)	66.955	66.955	.00	67.376	10.69	67.502	13.89	67.539	14.83	67.59	16.13
A5 (2.8m)	107.742	107.742	.00	108.178	11.07	108.321	14.71	108.361	15.72	108.417	17.15
A6 (3.9m)	148.563	148.563	.00	149.015	11.48	149.156	15.06	149.203	16.26	149.265	17.83
A7 (4.7m)	182.307	182.307	.00	162.759	11.48	182.907	15.24	182.943	16.15	183.01	17.86
A8 (5.8m)	224.406	224.406	.00	224.853	11.35	225	15.09	225.043	16.18	225.1	17.63
A9 (7.2m)	277.63	277.63	.00	278.082	11.48	278.225	15.11	278.284	16.61	278.336	17.93
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	27.09	10.10	10.30	11.10	10.00						
Tunnel ch.	2474.00	2559.90		2583.70							
A1 (0.3m)	9.038	9.253	5.46	9.262	5.69						
A2 (0.9m)	31.973	32.382	10.39	32.392	10.64						
A3 (1.4m)	49.252	49.904	16.56	49.916	16.87						
A4 (1.8m)	66.955	67.656	17.81	67.67	18.16						
A5 (2.8m)	107.742	108.505	19.38	108.526	19.91						
A6 (3.9m)	148.563	149.37	20.50	149.387	20.93						
A7 (4.7m)	182.307	183.113	20.47	183.133	20.98						
A8 (5.8m)	224.406	225.205	20.29	225.225	20.80						
A9 (7.2m)	277.63	278.43	20.32	278.45	20.83						
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2749EA — Chainage 2749 m
Date installed 24/10/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	24.10	24.10	22.37	24.10	23.00	25.10	.30	25.10	2.00	25.10	5.00
Tunnel ch.	2759.00	2759.00		2760.00		2762.00		2763.50		2765.50	
A1 (0.4m)	12.612	12.612	.00	12.614	.05	12.63	.46	12.643	.79	12.66	1.22
A2 (0.9m)	32.616	32.616	.00	32.622	.15	32.651	.89	32.672	1.42	32.7	2.13
A3 (1.4m)	51.043	51.043	.00	51.047	.10	51.079	.91	51.1	1.45	51.13	2.21
A4 (1.9m)	69.961	69.961	.00	69.965	.10	69.996	.89	70.02	1.50	70.052	2.31
A5 (2.7m)	103.25	103.25	.00	103.253	.08	103.286	.91	103.31	1.52	103.341	2.31
A6 (3.8m)	147.056	147.056	.00	147.061	.13	147.094	.97	147.117	1.55	147.15	2.39
A7 (4.7m)	184.76	184.76	.00	184.765	.13	184.796	.91	184.824	1.63	184.858	2.49
A8 (5.7m)	219.406	219.406	.00	219.41	.10	219.443	.94	219.472	1.68	219.502	2.44
A9 (7.0m)	273.039	273.039	.00	273.041	.05	273.075	.91	273.1	1.55	273.132	2.36
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	24.10	25.10	7.30	25.10	17.00	25.10	20.00	25.10	22.30	26.10	2.00
Tunnel ch.	2759.00	2768.00		2770.50		2773.50		2775.00		2779.00	
A1 (0.4m)	12.612	12.671	1.50	12.697	2.16	12.704	2.34	12.706	2.39	12.713	2.57
A2 (0.9m)	32.616	32.725	2.77	32.777	4.09	32.79	4.42	32.795	4.55	32.806	4.83
A3 (1.4m)	51.043	51.154	2.82	51.206	4.14	51.218	4.45	51.225	4.62	51.235	4.88
A4 (1.9m)	69.961	70.076	2.92	70.133	4.37	70.149	4.78	70.154	4.90	70.167	5.23
A5 (2.7m)	103.25	103.37	3.05	103.424	4.42	103.438	4.78	103.446	4.98	103.455	5.21
A6 (3.8m)	147.056	147.177	3.07	147.232	4.47	147.249	4.90	147.255	5.05	147.264	5.28
A7 (4.7m)	184.76	184.883	3.12	184.938	4.52	184.952	4.88	184.961	5.11	184.973	5.41
A8 (5.7m)	219.406	219.532	3.20	219.586	4.57	219.602	4.98	219.609	5.16	219.62	5.44
A9 (7.0m)	273.039	273.161	3.10	273.22	4.60	273.233	4.93	273.239	5.08	273.259	5.59
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2749EA — Chainage 2749 m
Date installed 24/10/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	24.10	26.10	3.00	26.10	7.00	27.10	.30	27.10	7.00	30.10	1.45
Tunnel ch.	2759.00	2780.00		2783.00		2795.00		2803.00		2824.12	
A1 (0.4m)	12.612	12.713	2.57	12.716	2.64	12.732	3.05	12.738	3.20	12.76	3.76
A2 (0.9m)	32.616	32.819	5.16	32.821	5.21	32.854	6.05	32.866	6.35	32.93	7.98
A3 (1.4m)	51.043	51.243	5.08	51.25	5.26	51.284	6.12	51.297	6.45	51.361	8.08
A4 (1.9m)	69.961	70.174	5.41	70.182	5.61	70.221	6.60	70.233	6.91	70.304	8.71
A5 (2.7m)	103.25	103.464	5.44	103.473	5.66	103.512	6.65	103.526	7.01	103.596	8.79
A6 (3.8m)	147.056	147.274	5.54	147.282	5.74	147.323	6.78	147.333	7.04	147.406	8.89
A7 (4.7m)	184.76	184.982	5.64	184.99	5.84	185.03	6.86	185.04	7.11	185.118	9.09
A8 (5.7m)	219.406	219.628	5.64	219.64	5.94	219.678	6.91	219.692	7.26	219.762	9.04
A9 (7.0m)	273.039	273.261	5.64	273.271	5.89	273.31	6.88	273.32	7.14	273.4	9.17
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	24.10	1.11	11.00	2.11	9.00						
Tunnel ch.	2759.00	2866.81		2894.00							
A1 (0.4m)	12.612	12.77	4.01	12.77	4.01						
A2 (0.9m)	32.616	32.954	8.59	32.964	8.84						
A3 (1.4m)	51.043	51.385	8.69	51.394	8.92						
A4 (1.9m)	69.961	70.334	9.47	70.34	9.63						
A5 (2.7m)	103.25	103.624	9.50	103.632	9.70						
A6 (3.8m)	147.056	147.434	9.60	147.444	9.86						
A7 (4.7m)	184.76	185.146	9.80	185.155	10.03						
A8 (5.7m)	219.406	219.794	9.86	219.802	10.06						
A9 (7.0m)	273.039	273.424	9.78	273.438	10.13						
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2996EA — Chainage 2996 m
Date installed 08/11/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11	8.11	12.30	8.11	21.30	8.11	21.50	8.11	22.30	8.11	23.10
Tunnel ch.	2996.50	2996.50		3003.30		3003.60		3004.70		3006.00	
A1 (0.4m)	12.386	12.386	.00	12.526	3.56	12.537	3.84	12.547	4.09	12.556	4.32
A2 (0.8m)	28.951	28.951	.00	29.309	9.09	29.333	9.70	29.36	10.39	29.384	11.00
A3 (1.3m)	48.337	48.337	.00	48.704	9.32	48.73	9.98	48.756	10.64	48.78	11.25
A4 (1.7m)	65.104	65.104	.00	65.405	9.68	65.513	10.39	65.539	11.05	65.565	11.71
A5 (3.2m)	125.988	125.988	.00	126.42	10.97	126.45	11.73	126.535	14.00	126.51	13.26
A6 (3.7m)	141.296	141.296	.00	141.725	10.90	141.756	11.68	141.785	12.42	141.815	13.18
A7 (4.7m)	180.169	180.169	.00	180.608	11.15	180.637	11.89	180.667	12.65	180.697	13.41
A8 (5.6m)	215.883	215.883	.00	216.324	11.20	216.357	12.04	216.385	12.75	216.419	13.61
A9 (6.5m)	250.501	250.501	.00	250.943	11.23	250.985	12.29	251.012	12.98	251.045	13.82
Comments	Datum					After arch expanded					

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11	9.11	1.15	9.11	1.45	9.11	2.00	9.11	2.30	9.11	3.00
Tunnel ch.	2996.50	3007.70		3009.20		3009.20		3010.70		3012.20	
A1 (0.4m)	12.386	12.589	5.16	12.593	5.26	12.597	5.36	12.602	5.49	12.607	5.61
A2 (0.8m)	28.951	29.46	12.93	29.472	13.23	29.478	13.39	29.49	13.69	29.504	14.05
A3 (1.3m)	48.337	48.858	13.23	48.87	13.54	48.88	13.79	48.89	14.05	48.906	14.45
A4 (1.7m)	65.104	65.651	13.89	65.664	14.22	65.671	14.40	65.685	14.76	65.704	15.24
A5 (3.2m)	125.988	126.607	15.72	126.622	16.10	126.633	16.38	126.649	16.79	126.669	17.30
A6 (3.7m)	141.296	141.912	15.65	141.926	16.00	141.938	16.31	141.953	16.69	141.974	17.22
A7 (4.7m)	180.169	180.794	15.88	180.809	16.26	180.821	16.56	180.838	16.99	180.857	17.48
A8 (5.6m)	215.883	216.515	16.05	216.528	16.38	216.54	16.69	216.556	17.09	216.578	17.65
A9 (6.5m)	250.501	251.142	16.28	251.159	16.71	251.166	16.89	251.182	17.30	251.203	17.83
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2996EA — Chainage 2996 m
Date installed 08/11/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11	9.11	3.30	9.11	4.00	9.11	4.30	9.11	5.00	9.11	5.30
Tunnel ch.	2996.50	3012.20		3013.70		3013.70		3015.20		3015.20	
A1 (0.4m)	12.386	12.615	5.82	12.622	5.99	12.628	6.15	12.634	6.30	12.639	6.43
A2 (0.8m)	28.951	29.52	14.45	29.533	14.78	29.545	15.09	29.555	15.34	29.57	15.72
A3 (1.3m)	48.337	48.928	15.01	48.944	15.42	48.958	15.77	48.978	16.28	48.991	16.61
A4 (1.7m)	65.104	65.731	15.93	65.755	16.54	65.777	17.09	65.801	17.70	65.824	18.29
A5 (3.2m)	125.988	126.697	18.01	126.722	18.64	126.745	19.23	126.772	19.91	126.796	20.52
A6 (3.7m)	141.296	142.002	17.93	142.028	18.59	142.051	19.18	142.07[illegible]	19.79	142.099	20.40
A7 (4.7m)	180.169	180.886	18.21	180.913	18.90	180.934	19.43	180.959	20.07	180.984	20.70
A8 (5.6m)	215.883	216.608	18.42	216.633	19.05	216.656	19.63	216.68	20.24	216.703	20.83
A9 (6.5m)	250.501	251.233	18.59	251.265	19.41	251.279	19.76	251.31	20.55	251.336	21.21
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11	9.11	6.00	9.11	6.30	9.11	7.00	9.11	7.30	9.11	17.00
Tunnel ch.	2996.50	3015.20		3016.20		3016.20		3016.70		3024.00	
A1 (0.4m)	12.386	12.645	6.58	12.653	6.78	12.668	7.16	12.672	7.26	12.74	8.99
A2 (0.8m)	28.951	29.586	16.13	29.602	16.54	29.626	17.15	29.635	17.37	29.75	20.29
A3 (1.3m)	48.337	49.017	17.27	49.034	17.70	49.059	18.34	49.07	18.62	49.22	22.43
A4 (1.7m)	65.104	65.843	18.77	65.877	19.63	65.906	20.37	65.921	20.75	66.095	25.17
A5 (3.2m)	125.988	126.82	21.13	126.849	21.87	126.88	22.66	126.895	23.04	127.101	28.27
A6 (3.7m)	141.296	142.126	21.08	142.152	21.74	142.183	22.53	142.202	23.01	142.406	28.19
A7 (4.7m)	180.169	181.019	21.59	181.04	22.12	181.066	22.78	181.086	23.29	181.292	28.52
A8 (5.6m)	215.883	216.732	21.56	216.757	22.20	216.788	22.99	216.805	23.42	217.013	28.70
A9 (6.5m)	250.501	251.357	21.74	251.386	22.48	251.42	23.34	251.428	23.55	251.668	29.64
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T2996EA — Chainage 2996 m
Date installed 08/11/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11	9.11	19.00	9.11	21.00	9.11	23.00	10.11	3.04	10.11	5.02
Tunnel ch.	2996.50	3027.00		3030.00		3033.00		3042.02		3043.72	
A1 (0.4m)	12.386	12.745	9.12	12.755	9.37	12.763	9.58	12.775	9.88	12.779	9.98
A2 (0.8m)	28.951	29.759	20.52	29.78	21.06	29.792	21.36	29.813	21.89	29.822	22.12
A3 (1.3m)	48.337	49.235	22.81	49.26	23.44	49.275	23.83	49.306	24.61	49.318	24.92
A4 (1.7m)	65.104	66.118	25.76	66.147	26.49	66.167	27.00	66.201	27.86	66.216	28.24
A5 (3.2m)	125.988	127.122	28.80	127.156	29.67	127.18	30.28	127.223	31.37	127.24	31.80
A6 (3.7m)	141.296	142.429	28.78	142.464	29.67	142.485	30.20	142.531	31.37	142.547	31.78
A7 (4.7m)	180.169	181.314	29.08	181.348	29.95	181.37	30.51	181.415	31.65	181.432	32.08
A8 (5.6m)	215.883	217.034	29.24	217.068	30.10	217.092	30.71	217.138	31.88	217.153	32.26
A9 (6.5m)	250.501	251.688	30.15	251.725	31.09	251.746	31.62	251.792	32.79	251.806	33.15
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11	10.11	6.19	13.11	11.00	16.11	1.00	19.11	14.00		
Tunnel ch.	2996.50	3045.42		3046.64		3093.01		3133.28			
A1 (0.4m)	12.386	12.782	10.06	12.835	11.40	12.857	11.96	12.882	12.60		
A2 (0.8m)	28.951	29.829	22.30	29.927	24.79	29.975	26.01	30.024	27.25		
A3 (1.3m)	48.337	49.325	25.10	49.457	28.45	49.515	29.92	49.58	31.57		
A4 (1.7m)	65.104	66.222	28.40	66.374	32.26	66.455	34.32	66.53	36.22		
A5 (3.2m)	125.988	127.249	32.03	127.436	36.78	127.521	38.94	127.616	41.35		
A6 (3.7m)	141.296	142.557	32.03	142.744	36.78	142.83	38.96	142.923	41.33		
A7 (4.7m)	180.169	181.442	32.33	181.63	37.11	181.715	39.27	181.81	41.68		
A8 (5.6m)	215.883	217.159	32.41	217.352	37.31	217.436	39.45	217.533	41.91		
A9 (6.5m)	250.501	251.818	33.45	252.003	38.15	-	-	-	-		
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3205EA — Chainage 3205 m
Date installed 22/11/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.11	22.11	15.00	22.11	21.55	22.11	22.25	22.11	23.15	23.11	1.00
Tunnel ch.	3205.50	3205.50		3212.70		3213.00		3214.28		3215.78	
A1 (0.5m)	14.233	14.233	.00	14.236	.08	14.248	.38	14.238	.13	14.239	.15
A2 (1.0m)	33.859	33.859	.00	33.864	.13	33.868	.23	33.864	.13	33.866	.18
A3 (1.4m)	52.002	52.002	.00	52.009	.18	52.012	.25	52.011	.23	52.011	.23
A4 (1.9m)	71.863	71.863	.00	71.877	.36	71.877	.36	71.875	.30	71.877	.36
A5 (2.9m)	110.276	110.276	.00	110.296	.51	110.305	.74	110.297	.53	110.297	.53
A6 (3.8m)	145.255	145.255	.00	145.274	.48	145.291	.91	145.272	.43	145.275	.51
A7 (4.9m)	189.42	189.42	.00	189.442	.56	189.464	1.12	189.439	.48	189.439	.48
A8 (5.7m)	220.962	220.962	.00	220.979	.43	221	.97	220.976	.36	220.982	.51
A9 (6.8m)	264.322	264.322	.00	264.344	.56	264.368	1.17	264.338	.41	264.344	.56
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.11	23.11	3.00	23.11	5.15	23.11	7.00	23.11	10.30	23.11	13.00
Tunnel ch.	3205.50	3219.20		3221.78		3223.78		3225.00		3225.00	
A1 (0.5m)	14.233	14.244	.28	14.398	4.19	14.426	4.90	14.463	5.84	14.48	6.27
A2 (1.0m)	33.859	33.873	.36	34.042	4.65	34.167	7.82	34.257	10.11	34.294	11.05
A3 (1.4m)	52.002	52.018	.41	52.189	4.75	52.317	8.00	52.46	11.63	52.519	13.13
A4 (1.9m)	71.863	71.885	.56	72.06	5.00	72.202	8.61	72.382	13.18	72.48	15.67
A5 (2.9m)	110.276	110.306	.76	110.479	5.16	110.628	8.94	110.813	13.6[illegible]	110.913	16.18
A6 (3.8m)	145.255	145.282	.69	145.458	5.16	145.604	8.86	145.785	13.46	145.893	16.21
A7 (4.9m)	189.42	189.447	.69	189.622	5.13	189.77	8.89	189.96	13.72	190.059	16.23
A8 (5.7m)	220.962	220.989	.69	221.162	5.08	221.314	8.94	221.507	13.84	221.602	16.26
A9 (6.8m)	264.322	264.352	.76	264.525	5.16	264.673	8.92	264.863	13.74	264.963	16.28
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.15m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3205EA — Chainage 3205 m
Date installed 22/11/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.11	23.11	14.30	23.11	15.30	23.11	17.55	23.11	20.02	23.11	23.11
Tunnel ch.	3205.50	3226.00		3227.00		3229.28		3232.00		3235.00	
A1 (0.5m)	14.233	14.492	6.58	14.5	6.78	14.511	7.06	14.521	7.32	14.53	7.54
A2 (1.0m)	33.859	34.317	11.63	34.33	11.96	34.363	12.80	34.377	13.16	34.4	13.74
A3 (1.4m)	52.002	52.547	13.84	52.57	14.43	52.605	15.32	52.633	16.03	52.66	16.71
A4 (1.9m)	71.863	72.52	16.69	72.55	17.45	72.598	18.67	72.635	19.61	72.676	20.65
A5 (2.9m)	110.276	110.96	17.37	110.998	18.34	111.054	19.76	111.102	20.98	111.167	22.63
A6 (3.8m)	145.255	145.94	17.40	145.975	18.29	146.034	19.79	146.085	21.08	146.148	22.68
A7 (4.9m)	189.42	190.111	17.35	190.141	18.31	190.203	19.89	190.255	21.21	190.32	22.86
A8 (5.7m)	220.962	221.652	17.53	221.685	18.36	221.744	19.86	221.793	21.11	221.86	22.81
A9 (6.8m)	264.322	265.011	17.50	265.05	18.49	265.109	19.99	265.157	21.21	265.224	22.91
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.11	24.11	1.00	24.11	3.00	24.11	5.00	24.11	7.00	26.11	10.49
Tunnel ch.	3205.50	3236.73		3239.73		3242.73		3245.73		3249.00	
A1 (0.5m)	14.233	14.535	7.67	14.542	7.85	14.547	7.98	14.551	8.08	14.596	9.22
A2 (1.0m)	33.859	34.407	13.92	34.418	14.20	34.434	14.61	34.44	14.76	34.543	17.37
A3 (1.4m)	52.002	52.675	17.09	52.692	17.53	52.706	17.88	52.722	18.29	52.865	21.92
A4 (1.9m)	71.863	72.697	21.18	72.721	21.79	72.747	22.45	72.768	22.99	72.983	28.45
A5 (2.9m)	110.276	111.197	23.39	111.232	24.28	111.266	25.15	111.291	25.78	111.564	32.72
A6 (3.8m)	145.255	146.179	23.47	146.215	24.38	146.245	25.15	146.27	25.78	146.552	32.94
A7 (4.9m)	189.42	190.347	23.55	190.385	24.51	190.419	25.37	190.443	25.98	190.733	33.35
A8 (5.7m)	220.962	221.893	23.65	221.932	24.64	221.961	25.37	221.987	26.04	222.28	33.48
A9 (6.8m)	264.322	265.254	23.67	265.294	24.69	265.323	25.43	265.35	26.11	265.639	33.45
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.15m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3205EA — Chainage 3205 m
Date installed 22/11/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.11	26.11	15.23	26.11	16.30	26.11	19.00	26.11	21.00	27.11	12.05
Tunnel ch.	3205.50	3254.10		3255.00		3258.00		3258.50		3271.08	
A1 (0.5m)	14.233	14.596	9.22	14.598	9.27	14.6	9.32	14.602	9.37	14.61	9.58
A2 (1.0m)	33.859	34.545	17.42	34.548	17.50	34.552	17.60	34.555	17.68	34.569	18.03
A3 (1.4m)	52.002	52.871	22.07	52.874	22.15	52.88	22.30	52.885	22.43	52.912	23.11
A4 (1.9m)	71.863	72.993	28.70	72.995	28.75	73.003	28.96	73.01	29.13	73.048	30.10
A5 (2.9m)	110.276	111.577	33.05	111.583	33.20	111.594	33.48	111.6	33.63	111.648	34.85
A6 (3.8m)	145.255	146.569	33.38	146.57	33.40	146.58	33.66	146.588	33.86	146.639	35.15
A7 (4.9m)	189.42	190.748	33.73	190.75	33.78	190.76	34.04	190.77	34.29	190.83	35.81
A8 (5.7m)	220.962	222.292	33.78	222.3	33.99	222.305	34.11	222.315	34.37	222.37	35.76
A9 (6.8m)	264.322	265.654	33.83	265.66	33.99	265.67	34.24	265.675	34.37	265.733	35.84
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.11	28.11	16.30	28.11	22.00	29.11	1.15	29.11	5.55	29.11	8.00
Tunnel ch.	3205.50	3295.00		3303.00		3305.58		3310.00		3314.00	
A1 (0.5m)	14.233	14.623	9.91	14.625	9.96	14.626	9.98	14.626	9.98	14.627	10.01
A2 (1.0m)	33.859	34.596	18.72	34.6	18.82	34.601	18.85	34.604	18.92	34.605	18.95
A3 (1.4m)	52.002	52.949	24.05	52.955	24.21	52.957	24.26	52.961	24.36	52.965	24.46
A4 (1.9m)	71.863	73.105	31.55	73.113	31.75	73.118	31.88	73.123	32.00	73.128	32.13
A5 (2.9m)	110.276	111.72	36.68	111.732	36.98	111.737	37.11	111.748	37.39	111.75	37.44
A6 (3.8m)	145.255	146.711	36.98	146.723	37.29	146.728	37.41	146.735	37.59	146.739	37.69
A7 (4.9m)	189.42	190.9	37.59	190.913	37.92	190.921	38.13	190.928	38.30	190.931	38.38
A8 (5.7m)	220.962	222.444	37.64	222.456	37.95	222.462	38.10	222.469	38.28	222.471	38.33
A9 (6.8m)	264.322	265.806	37.69	265.815	37.92	265.828	38.25	265.828	38.25	265.833	38.38
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.15m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3385EA — Chainage 3385 m
Date installed 04/12/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	4.12	4.12	12.30	4.12	15.15	4.12	17.00	4.12	18.30	4.12	19.30
Tunnel ch.	3392.00	3392.00		3395.15		3398.65		338.65		338.65	
A1 (0.4m)	11.051	11.051	.00	11.13	2.01	11.172	3.07	11.183	3.35	11.188	3.48
A2 (0.8m)	28.715	28.715	.00	28.901	4.72	28.997	7.16	29.025	7.87	29.039	8.23
A3 (1.3m)	47.489	47.489	.00	47.677	4.78	47.787	7.57	47.819	8.38	47.832	8.71
A4 (1.8m)	66.352	66.352	.00	66.622	6.86	66.804	11.48	66.851	12.67	66.87	13.16
A5 (2.8m)	105.877	105.877	.00	106.155	7.06	106.335	11.63	106.384	12.88	106.402	13.34
A6 (3.7m)	144.706	144.706	.00	144.987	7.14	145.164	11.63	145.21	12.80	145.229	13.28
A7 (4.7m)	181.721	181.721	.00	182.002	7.14	182.184	11.76	182.226	12.83	182.247	13.36
A8 (5.6m)	217.842	217.842	.00	218.125	7.19	218.309	11.86	218.354	13.00	218.375	13.54
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	4.12	4.12	21.15	4.12	22.30	5.12	.30	5.12	3.00	5.12	7.00
Tunnel ch.	3392.00	3399.50		3400.00		3403.15		3405.00		3409.00	
A1 (0.4m)	11.051	11.194	3.63	11.197	3.71	11.206	3.94	11.212	4.09	11.222	4.34
A2 (0.8m)	28.715	29.059	8.74	29.078	9.22	29.111	10.06	29.135	10.67	29.166	11.46
A3 (1.3m)	47.489	47.855	9.30	47.876	9.83	47.915	10.82	47.939	11.43	47.978	12.42
A4 (1.8m)	66.352	66.903	14.00	66.935	14.81	66.993	16.28	67.028	17.17	67.085	18.62
A5 (2.8m)	105.877	106.436	14.20	106.469	15.04	106.524	16.43	106.56	17.35	106.62	18.87
A6 (3.7m)	144.706	145.265	14.20	145.295	14.96	145.353	16.43	145.39	17.37	145.447	18.82
A7 (4.7m)	181.721	182.282	14.25	182.316	15.11	182.371	16.51	182.408	17.45	182.464	18.87
A8 (5.6m)	217.842	218.41	14.43	218.444	15.29	218.499	16.69	218.533	17.55	218.592	19.05
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3385EA
Date installed 04/12/84 Tunnel No. 2 Chainage 3385 m
Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	4.12	5.12	17.35	5.12	19.30	5.12	22.15	6.12	.30	6.12	5.00
Tunnel ch.	3392.00	3417.15		3419.65		3422.65		3425.00		3430.00	
A1 (0.4m)	11.051	11.232	4.60	11.235	4.67	11.237	4.72	11.241	4.83	11.246	4.95
A2 (0.8m)	28.715	29.213	12.65	29.224	12.93	29.237	13.26	29.246	13.49	29.261	13.87
A3 (1.3m)	47.489	48.029	13.72	48.039	13.97	48.051	14.27	48.061	14.53	48.08	15.01
A4 (1.8m)	66.352	67.166	20.68	67.183	21.11	67.208	21.74	67.222	22.10	67.25	22.81
A5 (2.8m)	105.877	106.7	20.90	106.716	21.31	106.743	22.00	106.755	22.30	106.785	23.06
A6 (3.7m)	144.706	145.527	20.85	145.543	21.26	145.572	22.00	145.586	22.35	145.618	23.16
A7 (4.7m)	181.721	182.547	20.98	182.56	21.31	182.586	21.97	182.603	22.40	182.635	23.22
A8 (5.6m)	217.842	218.672	21.08	218.691	21.56	218.714	22.15	218.731	22.58	218.765	23.44
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	4.12	6.12	7.20	6.12	17.40	6.12	20.20	7.12	.30	7.12	7.00
Tunnel ch.	3392.00	3432.00		3438.65		3442.15		3447.00		3453.00	
A1 (0.4m)	11.051	11.248	5.00	11.255	5.18	11.256	5.21	11.259	5.28	11.261	5.33
A2 (0.8m)	28.715	29.271	14.12	29.29	14.61	29.296	14.76	29.302	14.91	29.313	15.19
A3 (1.3m)	47.489	48.087	15.19	48.109	15.75	48.115	15.90	48.123	16.10	48.135	16.41
A4 (1.8m)	66.352	67.265	23.19	67.301	24.10	67.308	24.28	67.32	24.59	67.337	25.02
A5 (2.8m)	105.877	106.8	23.44	106.836	24.36	106.845	24.59	106.86	24.97	106.877	25.40
A6 (3.7m)	144.706	145.63	23.47	145.669	24.46	145.679	24.71	145.69	24.99	145.71	25.50
A7 (4.7m)	181.721	182.65	23.60	182.685	24.49	182.696	24.77	182.713	25.20	182.728	25.58
A8 (5.6m)	217.842	218.78	23.83	218.817	24.77	218.825	24.97	218.342	25.40	218.859	25.83
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3385EA — Chainage 3385 m
Date installed 04/12/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	4.12	7.12	9.50								
Tunnel ch.	3392.00	3454.15									
A1 (0.4m)	11.051	11.264	5.41								
A2 (0.8m)	28.715	29.318	15.32								
A3 (1.3m)	47.489	48.137	16.46								
A4 (1.8m)	66.352	67.345	25.22								
A5 (2.8m)	105.877	106.884	25.58								
A6 (3.7m)	144.706	145.716	25.65								
A7 (4.7m)	181.721	182.734	25.73								
A8 (5.6m)	217.842	218.868	26.06								
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	4.12										
Tunnel ch.	3392.00										
A1 (0.4m)	11.051										
A2 (0.8m)	28.715										
A3 (1.3m)	47.489										
A4 (1.8m)	66.352										
A5 (2.8m)	105.877										
A6 (3.7m)	144.706										
A7 (4.7m)	181.721										
A8 (5.6m)	217.842										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: November 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3457EA — Chainage 3457 m
Date installed 04/12/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.12	10.12	11.15	11.12	15.00	12.12	.03	12.12	13.51	13.12	9.30
Tunnel ch.	3457.50	3457.50		3458.26		3484.46		3492.66		3511.66	
A1 (0.4m)	11.7	11.7	.00	11.895	4.95	11.91	5.33	11.919	5.56	11.925	5.72
A2 (0.8m)	23.149	23.149	.00	23.725	14.63	23.737	14.94	23.744	15.11	23.764	15.62
A3 (1.3m)	45.396	45.396	.00	46.52	28.55	46.563	29.64	46.606	30.73	46.65	31.85
A4 (1.7m)	59.686	59.686	.00	61.274	40.34	61.366	42.67	61.465	45.19	61.565	47.73
A5 (2.8m)	102.878	102.878	.00	104.639	44.73	104.731	47.07	104.843	49.91	104.96	52.88
A6 (3.5m)	133.82	133.82	.00	135.595	45.09	135.683	47.32	135.79	50.04	135.903	52.91
A7 (4.6m)	175.468	175.468	.00	177.299	46.51	177.362	48.11	177.48	51.10	177.588	53.85
A8 (5.5m)	211.1	211.1	.00	212.932	46.53	213.018	48.72	213.124	51.41	213.24	54.36
A9 (6.6m)	254.019	254.019	.00	255.845	46.38	255.934	48.64	256.033	51.16	256.149	54.10
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	10.12	14.12	10.30	17.12	21.00	18.12	21.00	20.12	20.00		
Tunnel ch.	3457.50	3524.66		3551.03		3567.50		3579.78			
A1 (0.4m)	11.7	11.925	5.72	11.93	5.84	11.928	5.79	11.94	6.10		
A2 (0.8m)	23.149	23.77	15.77	23.775	15.90	23.773	15.85	23.778	15.98		
A3 (1.3m)	45.396	46.656	32.00	46.701	33.15	46.7	33.12	46.707	33.30		
A4 (1.7m)	59.686	61.614	48.97	61.71	51.41	61.73	51.92	61.733	51.99		
A5 (2.8m)	102.878	105.01	54.15	105.132	57.25	105.158	57.91	105.14	57.45		
A6 (3.5m)	133.82	135.96	54.36	136.078	57.35	136.1	57.91	136.085	57.53		
A7 (4.6m)	175.468	177.67	55.93	177.78	58.72	177.81	59.49	177.785	58.85		
A8 (5.5m)	211.1	213.29	55.63	213.429	59.16	213.432	59.23	213.41	58.67		
A9 (6.6m)	254.019	256.204	55.50	256.347	59.13	256.347	59.13	256.328	58.65		
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.15m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3522EA — Chainage 3522 m
Date installed 04/12/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	18.12	18.12	11.50	18.12	21.00	20.12	21.00	4.01	2.00	22.02	12.00
Tunnel ch.	3560.33	3560.33		3567.50		3579.78		3579.78		3579.78	
A1 (0.6m)	17.402	17.402	.00	17.435	.84	17.44	.97	17.469	1.70	17.525	3.12
A2 (0.9m)	30.895	30.895	.00	30.943	1.22	30.955	1.52	31	2.67	31.095	5.08
A3 (1.5m)	51.409	51.409	.00	51.47	1.55	51.493	2.13	51.56	3.84	51.685	7.01
A4 (1.8m)	66.87	66.87	.00	66.975	2.67	66.981	2.82	67.082	5.38	67.24	9.40
A5 (2.9m)	107.55	107.55	.00	107.661	2.82	107.661	2.82	107.77	5.59	107.921	9.42
A6 (3.8m)	142.622	142.622	.00	142.73	2.74	142.74	3.00	142.83	5.28	142.999	9.58
A7 (4.9m)	187.937	187.937	.00	188.052	2.92	188.057	3.05	188.17	5.92	188.327	9.91
A8 (5.3m)	202.731	202.731	.00	202.84	2.77	202.844	2.87	202.955	5.69	203.109	9.60
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	18.12										
Tunnel ch.	3560.33										
A1 (0.6m)	17.402										
A2 (0.9m)	30.895										
A3 (1.5m)	51.409										
A4 (1.8m)	66.87										
A5 (2.9m)	107.55										
A6 (3.8m)	142.622										
A7 (4.9m)	187.937										
A8 (5.3m)	202.731										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.15m in collar

Date: December 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Flexible Sonic Probe Extensometer 2T3575EA
Date installed 20/12/94 Tunnel No. 2

Chainage 3575 m
Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	21.12	21.12	10.30	4.01	2.00	5.01	2.00	22.02	12.00		
Tunnel ch.	3579.78	3579.78		3579.78	1985	3579.78		3579.78			
A1 (0.5m)	16.173	16.173	.00	16.19	.43	16.19	.43	16.116	-1.45		
A2 (0.9m)	30.682	30.682	.00	30.69	.20	30.693	.28	30.638	-1.12		
A3 (1.4m)	51.665	51.665	.00	51.675	.25	51.675	.25	51.619	-1.17		
A4 (1.8m)	67.13	67.13	.00	67.14	.25	67.145	.38	67.097	-.84		
A5 (2.3m)	89.946	89.946	.00	89.961	.38	89.963	.43	89.912	-.86		
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	21.12										
Tunnel ch.	3579.78										
A1 (0.5m)	16.173										
A2 (0.9m)	30.682										
A3 (1.4m)	51.665										
A4 (1.8m)	67.13										
A5 (2.3m)	89.946										
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.15m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	22.11		4.01		13.01		18.01		12.03	16.30
Tunnel ch.	770.55			227.47		250.00		273.32		770.55	
A1 (21m)	5.076	5.131		5.141		5.072		5.073		5.076	.00
A2 (36m)	10.616	10.673		10.684		10.613		10.615		10.616	.00
A3 (39m)	15.977	16.037		16.047		15.974		15.978		15.977	.00
A4 (40.5m)	21.63	21.692		21.7		21.627		21.63		21.63	.00
Calibration	32.872	32.866		32.862		32.873		32.867		32.872	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	13.03	.20	13.03	14.27	14.03	3.27	14.03	4.21	14.03	4.53
Tunnel ch.	770.55	779.05		786.04		789.90		799.19		799.92	
A1 (21m)	5.076	5.075	.10	5.077	.05	5.084	.25	5.084	.25	5.084	.23
A2 (36m)	10.616	10.618	.19	10.619	.10	10.631	.43	10.639	.64	10.64	.64
A3 (39m)	15.977	15.977	.13	15.978	.05	15.993	.46	15.998	.58	15.999	.58
A4 (40.5m)	21.63	21.632	.18	21.633	.10	21.647	.48	21.65	.56	21.65	.53
	32.872	32.867		32.871		32.87		32.87		32.871	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	5.17	14.03	5.30	14.03	5.46	14.03	6.03	14.03	6.15
Tunnel ch.	770.55	800.17		800.44		800.69		800.89		801.76	
A1 (21m)	5.076	5.085	.28	5.085	.25	5.085	.25	5.086	.28	5.087	.30
A2 (36m)	10.616	10.646	.81	10.65	.89	10.652	.94	10.653	.97	10.655	1.02
A3 (39m)	15.977	16.005	.76	16.012	.91	16.017	1.04	16.019	1.09	16.022	1.17
A4 (40.5m)	21.63	21.65	.56	21.65	.53	21.65	.53	21.653	.61	21.653	.61
Calibration	32.872	32.87		32.871		32.871		32.871		32.871	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	6.36	14.03	6.47	14.03	7.00	14.03	7.15	14.03	7.30
Tunnel ch.	770.55	801.90		802.21		802.34		802.51		802.89	
A1 (21m)	5.076	5.088	.33	5.087	.28	5.087	.28	5.087	.28	5.087	.30
A2 (36m)	10.616	10.659	1.12	10.662	1.17	10.663	1.19	10.665	1.24	10.667	1.32
A3 (39m)	15.977	16.029	1.35	16.032	1.40	16.033	1.42	16.036	1.50	16.038	1.57
A4 (40.5m)	21.63	21.655	.66	21.658	.71	21.659	.74	21.661	.79	21.664	.89
	32.872	32.871		32.872		32.872		32.872		32.871	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 3

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	7.46	14.03	10.00	14.03	11.20	14.03	16.20	14.03	16.30
Tunnel ch.	770.55	803.24		803.24		803.24		803.24		803.30	
A1 (21m)	5.076	5.088	.33	5.087	.30	5.088	.30	5.089	.25	5.089	.25
A2 (36m)	10.616	10.668	1.35	10.672	1.45	10.674	1.47	10.675	1.42	10.676	1.45
A3 (39m)	15.977	16.042	1.68	16.045	1.75	16.048	1.80	16.05	1.78	16.054	1.88
A4 (40.5m)	21.63	21.666	.94	21.67	1.04	21.672	1.07	21.674	1.04	21.677	1.12
Calibration	32.872	32.871		32.871		32.872		32.875		32.875	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	16.46	14.03	17.00	14.03	17.15	14.03	17.30	14.03	17.45
Tunnel ch.	770.55	803.50		803.89		803.89		804.01		804.50	
A1 (21m)	5.076	5.089	.25	5.089	.25	5.089	.25	5.09	.28	5.089	.25
A2 (36m)	10.616	10.676	1.45	10.676	1.45	10.677	1.47	10.678	1.50	10.68	1.55
A3 (39m)	15.977	16.055	1.91	16.055	1.91	16.054	1.88	16.055	1.91	16.057	1.96
A4 (40.5m)	21.63	21.679	1.17	21.679	1.17	21.679	1.17	21.68	1.19	21.681	1.22
	32.872	32.875		32.875		32.875		32.875		32.875	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 4

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	18.00	14.03	18.15	14.03	18.30	14.03	18.45	14.03	19.00
Tunnel ch.	770.55	804.74		805.00		805.32		805.70		805.91	
A1 (21m)	5.076	5.09	.28	5.09	.28	5.09	.28	5.09	.28	5.091	.33
A2 (36m)	10.616	10.682	1.60	10.683	1.63	10.685	1.68	10.685	1.68	10.687	1.75
A3 (39m)	15.977	16.059	2.01	16.062	2.08	16.064	2.13	16.064	2.13	16.065	2.18
A4 (40.5m)	21.63	21.683	1.27	21.685	1.32	21.687	1.37	21.688	1.40	21.689	1.45
Calibration	32.872	32.875		32.875		32.875		32.875		32.874	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	19.15	14.03	19.30	14.03	19.45	14.03	20.00	14.03	20.15
Tunnel ch.	770.55	806.30		806.82		806.89		806.89		806.89	
A1 (21m)	5.076	5.091	.30	5.092	.33	5.091	.30	5.091	.30	5.091	.30
A2 (36m)	10.616	10.688	1.75	10.69	1.80	10.691	1.83	10.691	1.83	10.69	1.80
A3 (39m)	15.977	16.067	2.21	16.07	2.29	16.07	2.29	16.071	2.31	16.071	2.31
A4 (40.5m)	21.63	21.692	1.50	21.694	1.55	21.695	1.57	21.696	1.60	21.695	1.57
	32.872	32.875		32.875		32.875		32.875		32.875	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 5

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	20.30	14.03	20.45	14.03	21.00	14.03	21.10	14.03	21.40
Tunnel ch.	770.55	806.99		807.20		807.65		807.90		808.61	
A1 (21m)	5.076	5.091	.30	5.092	.36	5.092	.33	5.092	.33	5.093	.36
A2 (36m)	10.616	10.691	1.83	10.692	1.88	10.693	1.88	10.695	1.93	10.697	1.98
A3 (39m)	15.977	16.072	2.34	16.073	2.39	16.074	2.39	16.076	2.44	16.077	2.46
A4 (40.5m)	21.63	21.696	1.60	21.697	1.65	21.699	1.68	21.7	1.70	21.702	1.75
Calibration	32.872	32.875		32.874		32.875		32.875		32.875	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	22.00	14.03	22.15	14.03	22.30	14.03	22.45	14.03	23.00
Tunnel ch.	770.55	808.80		809.05		809.45		809.79		809.93	
A1 (21m)	5.076	5.092	.30	5.093	.36	5.093	.38	5.093	.36	5.094	.41
A2 (36m)	10.616	10.698	1.98	10.698	2.01	10.7	2.08	10.7	2.06	10.701	2.11
A3 (39m)	15.977	16.08	2.51	16.08	2.54	16.084	2.67	16.083	2.62	16.085	2.69
A4 (40.5m)	21.63	21.703	1.75	21.704	1.80	21.707	1.91	21.708	1.91	21.709	1.96
	32.872	32.876		32.875		32.874		32.875		32.874	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 6

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	14.03	23.30	14.03	23.45	15.03	.25	15.03	.45	15.03	1.00
Tunnel ch.	770.55	810.63		811.01		811.43		811.64		811.79	
A1 (21m)	5.076	5.094	.41	5.094	.41	5.095	.41	5.096	.43	5.096	.43
A2 (36m)	10.616	10.706	2.24	10.708	2.29	10.71	2.31	10.711	2.34	10.713	2.39
A3 (39m)	15.977	16.089	2.79	16.091	2.84	16.095	2.92	16.097	2.97	16.098	3.00
A4 (40.5m)	21.63	21.713	2.06	21.716	2.13	21.718	2.16	21.72	2.21	21.722	2.26
Calibration	32.872	32.874		32.874		32.875		32.875		32.875	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	15.03	1.15	15.03	1.30	15.03	1.45	15.03	2.00	15.03	2.15
Tunnel ch.	770.55	812.24		812.93		812.93		813.48		813.78	
A1 (21m)	5.076	5.096	.43	5.096	.46	5.096	.43	5.096	.43	5.097	.46
A2 (36m)	10.616	10.714	2.41	10.715	2.46	10.716	2.46	10.716	2.46	10.718	2.51
A3 (39m)	15.977	16.099	3.02	16.1	3.07	16.101	3.07	16.102	3.10	16.103	3.12
A4 (40.5m)	21.63	21.723	2.29	21.724	2.34	21.724	2.31	21.726	2.36	21.727	2.39
	32.872	32.875		32.874		32.875		32.875		32.875	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985

Golder Associates

Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 7

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	15.03	2.30	15.03	3.35	15.03	4.00	15.03	4.30	15.03	5.30
Tunnel ch.	770.55	814.18		815.20		815.93		815.93		817.43	
A1 (21m)	5.076	5.098	.48	5.098	.48	5.098	.48	5.098	.48	5.099	.51
A2 (36m)	10.616	10.719	2.54	10.722	2.62	10.723	2.64	10.724	2.67	10.726	2.72
A3 (39m)	15.977	16.104	3.15	16.108	3.25	16.109	3.28	16.111	3.33	16.113	3.38
A4 (40.5m)	21.63	21.728	2.41	21.732	2.51	21.733	2.54	21.734	2.57	21.736	2.62
Calibration	32.872	32.875		32.875		32.875		32.875		32.875	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	15.03	10.00	15.03	12.42	15.03	14.40	15.03	14.40	15.03	15.30
Tunnel ch.	770.55	820.23		820.23		820.23		820.23		821.73	
A1 (21m)	5.076	5.101	.56	5.102	.58	5.102	.58	5.102	.58	5.101	.56
A2 (36m)	10.616	10.733	2.90	10.735	2.95	10.736	2.97	10.737	3.00	10.738	3.02
A3 (39m)	15.977	16.122	3.61	16.123	3.63	16.124	3.66	16.125	3.68	16.125	3.68
A4 (40.5m)	21.63	21.745	2.84	21.746	2.87	21.748	2.92	21.748	2.92	21.749	2.95
	32.872	32.875		32.875		32.875		32.875		32.875	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T800EB (Crosshole to Tunnel No. 2) Chainage 800 m
Date installed 17/11/83 Tunnel No. 3 Sheet 8

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	15.03	17.20	15.03	19.30	16.03	9.17	16.03	10.56	19.03	13.30
Tunnel ch.	770.55	823.23		825.20		836.97		837.34		846.55	
A1 (21m)	5.076	5.102	.58	5.103	.61	5.104	.64	5.104	.64	5.107	.71
A2 (36m)	10.616	10.739	3.05	10.74	3.07	10.745	3.20	10.745	3.20	10.754	3.43
A3 (39m)	15.977	16.127	3.73	16.128	3.76	16.134	3.91	16.135	3.94	16.15	4.32
A4 (40.5m)	21.63	21.75	2.97	21.752	3.02	21.758	3.18	21.759	3.20	21.77	3.48
Calibration	32.872	32.875		32.875		32.875		32.875		32.875	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	12.03	21.03	11.00	22.03	7.30	25.03	11.30	26.03	13.00		
Tunnel ch.	770.55	876.09		894.00		925.08		3579.78	1985		
A1 (21m)	5.076	5.111	1.04	5.108	.81	5.11	.94	5.094	1.07		
A2 (36m)	10.616	10.757	3.73	10.754	3.51	10.758	3.68	10.75	4.01		
A3 (39m)	15.977	16.15	4.55	16.15	4.39	16.153	4.55	16.183	5.84		
A4 (40.5m)	21.63	21.773	3.78	21.776	3.71	21.775	3.76	21.855	6.32		
	32.872	32.866		32.872		32.869		32.848			
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	22.11		4.01		13.01		16.03	11.00	19.03	13.30
Tunnel ch.	894.57			227.47		250.00		836.97		846.55	
A1 (21m)	5.234	5.226		5.22		5.227		5.227		5.225	
A2 (36m)	10.665	10.665		10.668		10.678		10.668		10.669	
A3 (39m)	16.111	16.107		16.102		16.109		16.105		16.106	
A4 (41.5m)	21.732	21.73		21.727		21.734		21.728		21.733	
Calibration	32.856	32.862		32.857		32.864		32.86		32.86	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	21.03	11.00	22.03	7.15	22.03	7.45	22.03	16.25	22.03	16.45
Tunnel ch.	894.57	876.09		893.73		894.57		894.57		895.00	
A1 (21m)	5.234	5.223		5.232		5.234		5.234	.00	5.232	-.08
A2 (36m)	10.665	10.669		10.669		10.668		10.665	.00	10.666	.00
A3 (39m)	16.111	16.106		16.108		16.111		16.111	.00	16.115	.08
A4 (41.5m)	21.732	21.73		21.732		21.733		21.732	.00	21.733	.00
	32.856	32.859		32.856		32.858		32.856		32.857	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2)
Date installed 17/11/83 Tunnel No. 3 Chainage 900 m
Sheet 2

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	22.03	17.00	22.03	17.15	22.03	17.30	22.03	17.45	22.03	18.00
Tunnel ch.	894.57	896.63		896.70		897.08		897.50		897.95	
A1 (21m)	5.234	5.235	.00	5.233	-.05	5.234	-.03	5.236	.05	5.238	.10
A2 (36m)	10.665	10.666	.00	10.665	-.03	10.665	-.03	10.665	.00	10.666	.03
A3 (39m)	16.111	16.112	.00	16.111	-.03	16.112	.00	16.114	.08	16.115	.10
A4 (41.5m)	21.732	21.735	.05	21.734	.03	21.735	.05	21.737	.13	21.737	.13
Calibration	32.856	32.857		32.857		32.857		32.856		32.856	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	22.03	18.15	22.03	18.30	22.03	18.45	22.03	19.00	22.03	19.15
Tunnel ch.	894.57	898.27		898.43		898.80		899.33		899.73	
A1 (21m)	5.234	5.241	.15	5.241	.15	5.244	.23	5.246	.30	5.248	.36
A2 (36m)	10.665	10.665	-.03	10.665	-.03	10.666	.00	10.666	.03	10.666	.03
A3 (39m)	16.111	16.118	.15	16.119	.18	16.121	.23	16.123	.30	16.125	.36
A4 (41.5m)	21.732	21.74	.18	21.742	.23	21.743	.25	21.745	.33	21.749	.43
	32.856	32.857		32.857		32.857		32.856		32.856	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985

Golder Associates

Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 3

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	22.03	19.30	22.03	19.45	22.03	20.00	22.03	20.15	22.03	20.30
Tunnel ch.	894.57	899.73		900.00		900.29		900.29		900.29	
A1 (21m)	5.234	5.249	.38	5.252	.46	5.25	.38	5.25	.38	5.25	.41
A2 (36m)	10.665	10.665	.00	10.666	.03	10.666	.00	10.666	.00	10.666	.03
A3 (39m)	16.111	16.127	.41	16.129	.46	16.143	.79	16.145	.84	16.145	.86
A4 (41.5m)	21.732	21.749	.43	21.751	.48	21.766	.84	21.769	.91	21.77	.97
Calibration	32.856	32.856		32.856		32.857		32.857		32.856	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	22.03	20.45	22.03	21.00	22.03	21.15	22.03	21.30	22.03	21.45
Tunnel ch.	894.57	900.40		900.96		901.00		901.41		901.60	
A1 (21m)	5.234	5.251	.43	5.25	.41	5.25	.41	5.25	.41	5.25	.41
A2 (36m)	10.665	10.666	.03	10.665	.00	10.666	.03	10.666	.03	10.666	.03
A3 (39m)	16.111	16.15	.99	16.158	1.19	16.16	1.24	16.167	1.42	16.176	1.65
A4 (41.5m)	21.732	21.773	1.04	21.72	1.27	21.784	1.32	21.79	1.47	21.799	1.70
	32.856	32.856		32.854		32.856		32.856		32.856	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Date: March 1985 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 4

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	22.03	22.00	22.03	22.13	22.03	22.15	22.03	22.30	22.03	22.45
Tunnel ch.	894.57	902.31		902.70		902.73		902.73		902.80	
A1 (21m)	5.234	5.25	.41	.498		5.25	.41	5.25	.43	5.251	.48
A2 (36m)	10.665	10.666	.03	.451		10.772	2.72	10.799	3.43	10.799	3.45
A3 (39m)	16.111	16.184	1.85	.43		16.193	2.08	16.24	3.30	16.24	3.33
A4 (41.5m)	21.732	21.807	1.91	.548		21.813	2.06	21.924	4.90	21.924	4.93
Calibration	32.856	32.856				32.856		32.855		32.854	
Comments	Datum			Micrometer							

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	22.03	23.00	22.03	23.17	22.03	23.30	23.03	.30	23.03	.45
Tunnel ch.	894.57	903.24		903.80		904.02		904.56		904.95	
A1 (21m)	5.234	5.252	.51	5.251	.48	5.253	.48	5.253	.48	5.255	.43
A2 (36m)	10.665	10.799	3.45	10.799	3.45	10.799	3.40	10.799	3.40	10.805	3.45
A3 (39m)	16.111	16.241	3.35	16.241	3.35	16.241	3.30	16.241	3.30	16.248	3.38
A4 (41.5m)	21.732	21.924	4.93	21.924	4.93	21.926	4.93	21.927	4.95	21.93	4.93
	32.856	32.854		32.854		32.856		32.856		32.86	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 5

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	1.00	23.03	1.15	23.03	1.30	23.03	1.45	23.03	2.00
Tunnel ch.	894.57	905.34		905.62		905.62		905.73		906.28	
A1 (21m)	5.234	5.256	.43	5.256	.46	5.256	.43	5.256	.43	5.256	.43
A2 (36m)	10.665	10.805	3.43	10.805	3.45	10.805	3.43	10.806	3.45	10.806	3.45
A3 (39m)	16.111	16.251	3.43	16.254	3.53	16.255	3.53	16.258	3.61	16.262	3.71
A4 (41.5m)	21.732	21.93	4.90	21.93	4.93	21.93	4.90	21.93	4.90	21.93	4.90
Calibration	32.856	32.861		32.86		32.861		32.861		32.861	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	2.15	23.03	2.30	23.03	2.40	23.03	3.00	23.03	3.03
Tunnel ch.	894.57	906.45		906.66		906.90		907.14		907.23	
A1 (21m)	5.234	5.256	.46	5.256	.46	5.261	.66	5.261	.66	5.261	.66
A2 (36m)	10.665	10.805	3.45	10.805	3.45	10.845	4.55	10.845	4.55	10.851	4.70
A3 (39m)	16.111	16.265	3.81	16.268	3.89	16.317	5.21	16.318	5.23	16.324	5.38
A4 (41.5m)	21.732	21.93	4.93	21.93	4.93	21.968	6.48	21.988	6.48	21.995	6.65
	32.856	32.86		32.86		32.857		32.857		32.857	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 6

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	3.15	23.03	3.20	23.03	3.20	23.03	3.30	23.03	3.45
Tunnel ch.	894.57	907.40		907.50		907.50		907.65		907.98	
A1 (21m)	5.234	5.262	.66	5.265	.79	5.265	.79	5.265	.76	5.266	.76
A2 (36m)	10.665	10.851	4.67	10.852	4.75	10.863	5.03	10.863	5.00	10.864	5.00
A3 (39m)	16.111	16.326	5.41	16.327	5.49	16.329	5.54	16.331	5.56	16.331	5.54
A4 (41.5m)	21.732	21.996	6.65	22.003	6.88	22.004	6.91	22.004	6.88	22.005	6.88
Calibration	32.856	32.858		32.856		32.856		32.857		32.858	
Comments	Datum					Pushed rods					

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	4.00	23.03	4.15	23.03	4.30	23.03	4.45	23.03	5.00
Tunnel ch.	894.57	908.10		908.30		908.30		908.60		908.73	
A1 (21m)	5.234	5.263	.69	5.263	.71	5.265	.76	5.265	.76	5.265	.76
A2 (36m)	10.665	10.861	4.93	10.862	4.98	10.861	4.95	10.861	4.95	10.861	4.95
A3 (39m)	16.111	16.33	5.51	16.33	5.54	16.331	5.56	16.331	5.56	16.331	5.56
A4 (41.5m)	21.732	22.003	6.83	22.003	6.86	22.003	6.86	22.005	6.91	22.003	6.86
	32.856	32.858		32.857		32.857		32.857		32.857	
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 7

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	5.00	23.03	5.15	23.03	5.30	23.03	6.00	23.03	6.25
Tunnel ch.	894.57	908.73		908.73		909.03		909.68		910.12	
A1 (21m)	5.234	.51		5.265	.76	5.264	.74	5.264	.74	5.263	.71
A2 (36m)	10.665	.539		10.863	5.00	10.862	4.98	10.862	4.98	10.862	4.98
A3 (39m)	16.111	.567		16.331	5.56	16.33	5.54	16.329	5.51	16.329	5.51
A4 (41.5m)	21.732	.736		22.005	6.91	22.004	6.88	22.003	6.86	22.004	6.88
Calibration	32.856			32.857		32.857		32.857		32.857	
Comments	Datum	Micrometer									

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	11.30	23.03	11.35	23.03	11.35	23.03	11.45	23.03	12.00
Tunnel ch.	894.57	911.63		911.63		911.63		911.63		911.63	
A1 (21m)	5.234	5.263	.71	5.27	.89	.532		5.271	.91	5.271	.91
A2 (36m)	10.665	10.86	4.93	10.899	5.92	.574		10.899	5.92	10.898	5.89
A3 (39m)	16.111	16.33	5.54	16.371	6.58	.611		16.374	6.65	16.377	6.73
A4 (41.5m)	21.732	22.004	6.88	22.042	7.85	.776		22.061	8.33	22.05	8.05
	32.856	32.857		32.857				32.857		32.857	
Comments	Datum					Micrometer					

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 8

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	16.40	23.03	17.00	23.03	17.15	23.03	17.30	23.03	17.45
Tunnel ch.	894.57	912.73		913.00		913.23		913.30		913.50	
A1 (21m)	5.234	5.273	.99	5.274	1.02	5.274	.99	5.274	.99	5.273	.99
A2 (36m)	10.665	10.911	6.25	10.909	6.20	10.908	6.15	10.908	6.15	10.908	6.17
A3 (39m)	16.111	16.385	6.96	16.384	6.93	16.385	6.93	16.386	6.96	16.386	6.99
A4 (41.5m)	21.732	22.066	8.48	22.068	8.53	22.078	8.76	22.078	8.76	22.074	8.69
Calibration	32.856	32.856		32.856		32.857		32.857		32.856	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	18.00	23.03	18.10	23.03	18.15	23.03	18.30	23.03	18.45
Tunnel ch.	894.57	913.73		913.95		914.23		914.23		914.23	
A1 (21m)	5.234	5.274	1.02	.519		5.275	.99	5.275	.99	5.276	1.02
A2 (36m)	10.665	10.925	6.60	.608		10.926	6.58	10.924	6.53	10.922	6.48
A3 (39m)	16.111	16.392	7.14	.633		16.393	7.11	16.394	7.14	16.394	7.14
A4 (41.5m)	21.732	22.07	8.59	.797		22.08	8.79	22.078	8.74	22.083	8.86
	32.856	32.856				32.858		32.858		32.858	
Comments	Datum			Micrometer							

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Dunkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T900EB (Crosshole to Tunnel No. 2) Chainage 900 m
Date installed 17/11/83 Tunnel No. 3 Sheet 9

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	23.03	19.02	23.03	19.15	23.03	19.30	23.03	19.45	23.03	20.00
Tunnel ch.	894.57	914.23		914.23		914.40		914.73		914.73	
A1 (21m)	5.234	5.291	1.40	5.293	1.45	5.296	1.52	5.292	1.42	5.273	.94
A2 (36m)	10.665	10.925	6.55	10.917	6.35	10.919	6.40	10.916	6.32	10.923	6.50
A3 (39m)	16.111	16.398	7.24	16.396	7.19	16.397	7.21	16.398	7.24	16.396	7.19
A4 (41.5m)	21.732	22.077	8.71	22.08	8.79	22.089	9.02	22.078	8.74	22.072	8.59
Calibration	32.856	32.858		32.858		32.858		32.858		32.858	
Comments	Datum										

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	22.03	24.03	11.20	25.03	11.25	26.03	13.00				
Tunnel ch.	894.57	925.08		925.08		3579.78	1985				
A1 (21m)	5.234	5.286	1.32	5.284	1.27	5.257	1.32				
A2 (36m)	10.665	10.945	7.11	10.942	7.04	11.007	9.42				
A3 (39m)	16.111	16.429	8.08	16.425	7.98	16.405	8.20				
A4 (41.5m)	21.732	22.105	9.47	22.101	9.37	22.1	10.08				
	32.856	32.856		32.856		32.827					
Comments	Datum										

Notes: All readings taken from surface anchor located at approx. 0.1m in collar

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T1025EA
Date installed 08/11/83 Tunnel No. 3

Chainage 1025 m
Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11	8.11		8.11		5.01					
Tunnel ch.	1027.00	1027.00		1027.00		1027.00	1984				
A1 (3m)	5.706	5.706	.00	5.723	.36	5.714	-.05				
A2 (10m)	10.938	10.938	.00	10.947	.36	10.932	-.05				
A3 (21m)	16.633	16.633	.00	16.643	.36	16.634	-.05				
Calibration	21.913	21.913		21.916		21.923					
Comments	Datum	Probe 128		Probe 130		Probe 128					

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	8.11										
Tunnel ch.	1027.00										
A1 (3m)	5.706										
A2 (10m)	10.938										
A3 (21m)	16.633										
Calibration	21.913										
Comments	Datum										

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T1025EB — Chainage 1025 m
Date installed 03/11/83 — Tunnel No. 3 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	3.11	3.11		4.11		8.11		8.11		22.11	
Tunnel ch.	1027.00	1027.00		1027.00		1027.00		1027.00		1027.00	
A1 (3m)	5.89	5.89	.00	5.886	-.10	5.886	-.03	5.909	.41	5.905	-1.09
A2 (10m)	11.004	11.004	.00	11.005	-.10	11.003	-.03	11.022	.41	11.026	-1.09
A3 (21m)	16.493	16.493	.00	16.494	-.10	16.461	-.03	16.474	.41	16.497	-1.09
Calibration	21.918	21.918		21.918		21.915		21.921		21.976	
Comments	Datum	Probe 128		Probe 128		Probe 128		Probe 130		Probe 336	

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	3.11	22.11		22.11		4.01		4.01			
Tunnel ch.	1027.00	1027.00		1027.00		1027.00	1984	1027.00			
A1 (3m)	5.89	5.909	.38	5.889	.03	5.891	-.05	5.903	.03		
A2 (10m)	11.004	11.022	.36	11.006	.03	11.009	-.05	11.032	.03		
A3 (21m)	16.493	16.476	-.53	16.462	.03	16.466	-.05	16.494	.03		
Calibration	21.918	21.922		21.916		21.921		21.972			
Comments	Datum	Probe 130		Probe 128		Probe 128		Probe 336			

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
EXTENSOMETER DATA

Instrument Section Rigid Sonic Probe Extensometer 3T1025EC — Chainage 1025 m
Date installed 01/11/83 — Tunnel No. 3 — Sheet 1

	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	2.11	2.11		3.11		4.11		8.11		8.11	
Tunnel ch.	1027.00	1027.00		1027.00		1027.00		1027.00		1027.00	
A1 (3m)	5.412	5.412	.00	5.408	-.10	5.408	-.10	5.411	-.08	5.429	.51
A2 (10m)	10.601	10.601	.00	10.598	-.10	10.598	-.10	10.601	-.08	10.613	.51
A3 (21m)	16.379	16.379	.00	16.373	-.10	16.373	-.10	16.376	-.08	16.382	.51
Calibration	21.959	21.959		21.959		21.959		21.961		21.956	
Comments	Datum	Probe 128		Probe 128		Probe 128		Probe 128		Probe 130	

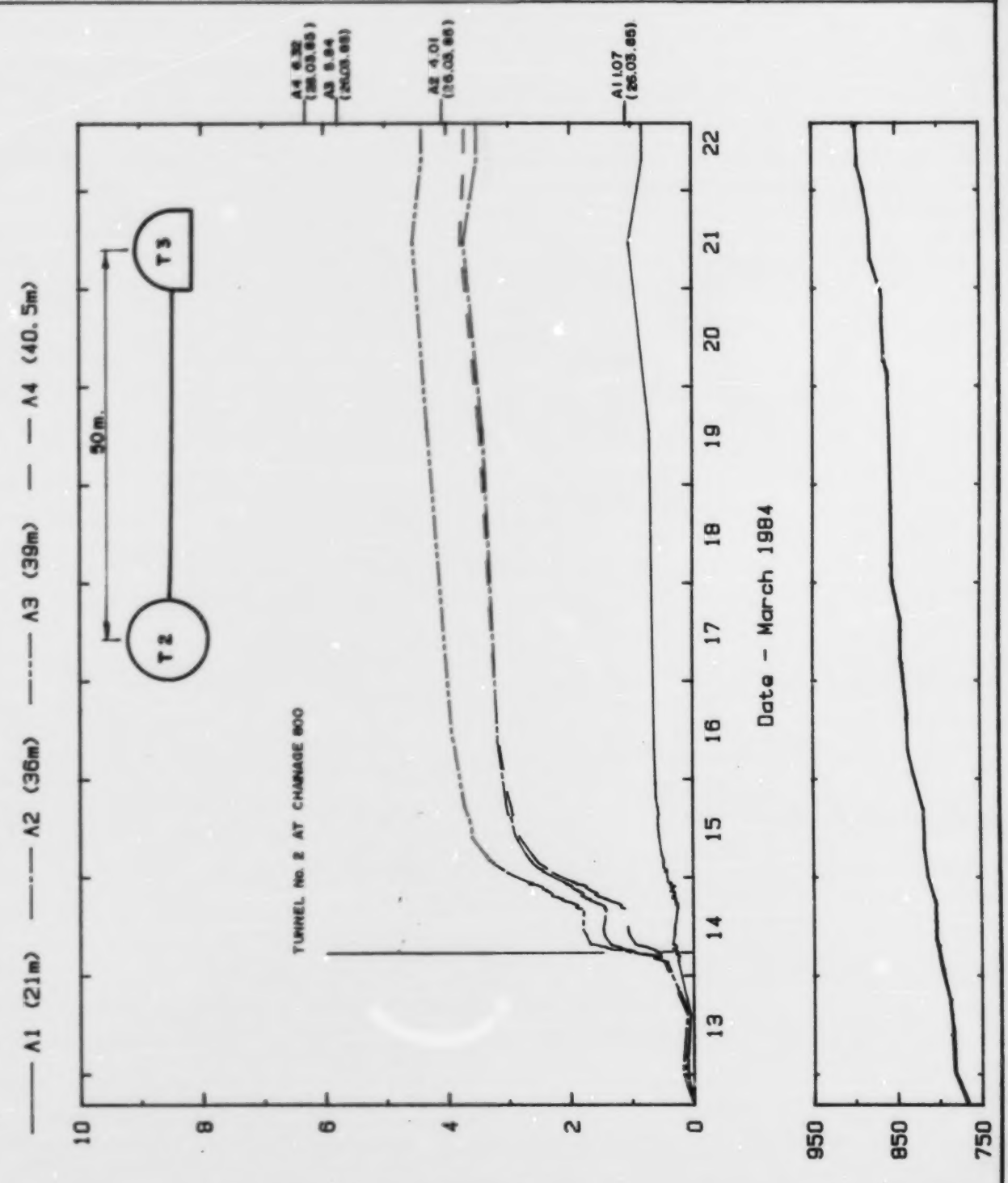
	Reading	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm	Reading	Dif.mm
Date/Time	1.11	22.11		22.11		22.11		4.01		4.01	
Tunnel ch.	1027.00	1027.00		1027.00		1027.00		1027.00	1984	1027.00	
A1 (3m)	5.412	5.421	-.84	5.425	.46	5.409	-.05	5.407	.46	5.422	-.86
A2 (10m)	10.601	10.616	-.69	10.607	.46	10.6	-.05	10.598	.46	10.617	-.86
A3 (21m)	16.379	16.405	-.41	16.383	.46	16.374	-.05	16.372	.46	16.405	-.86
Calibration	21.959	22.001		21.954		21.958		21.952		22.003	
Comments	Datum	Probe 336		Probe 130		Probe 128		Probe 128		Probe 336	

Notes:

RIGID PROBE EXTENSOMETER

3T800EB - Crosshole to T #2 - ch. 800m

FIGURE C.1



Date April 1985

Project No. 831-6014

Golder Associates

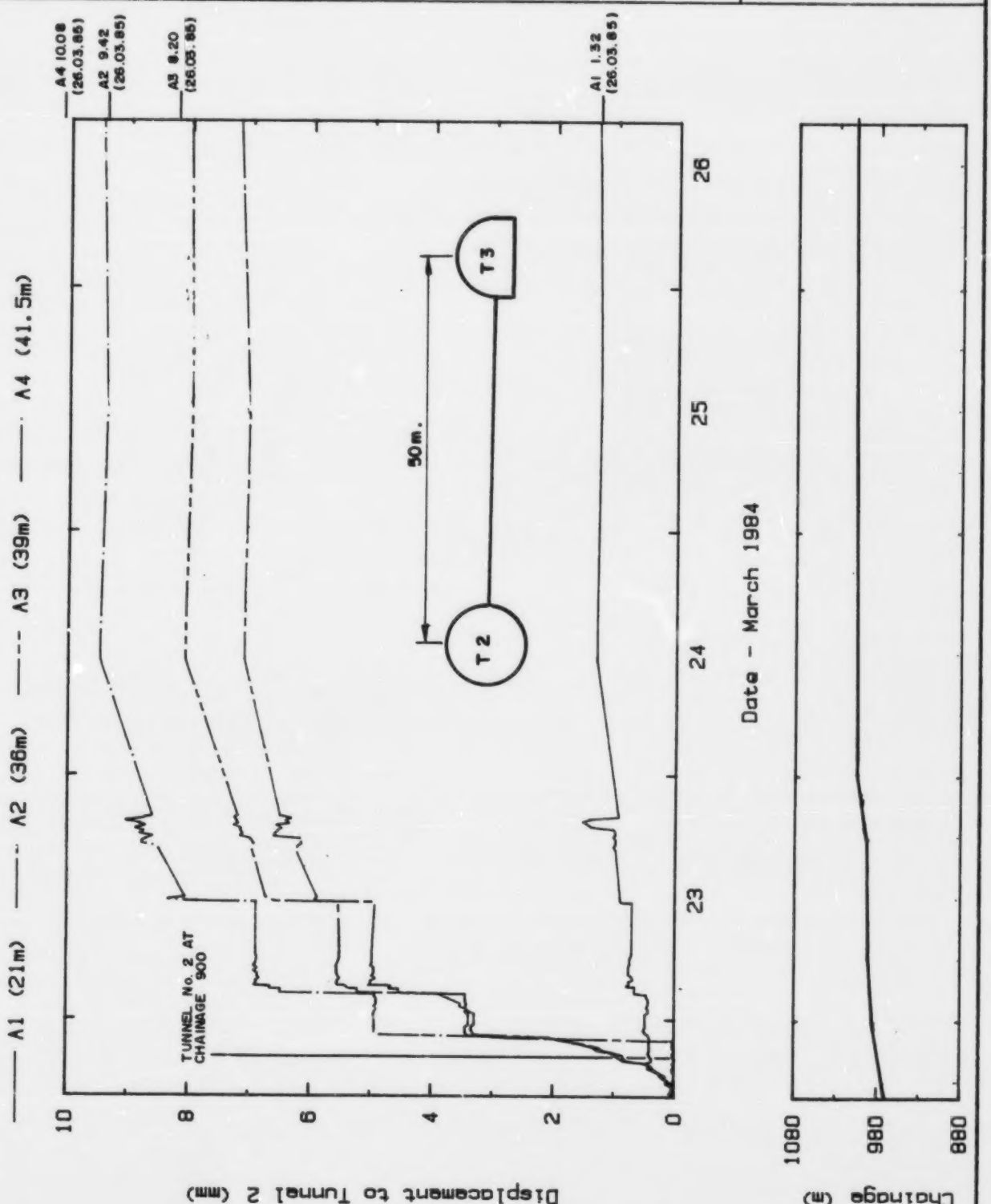
Drawn JLG

Chkd.

EXTENSOMETER PLOT 3T900EB

Crosshole Tunnel 3 to 2 - ch. 900m

FIGURE C.2



Date April 1985

Project No. 831-6014

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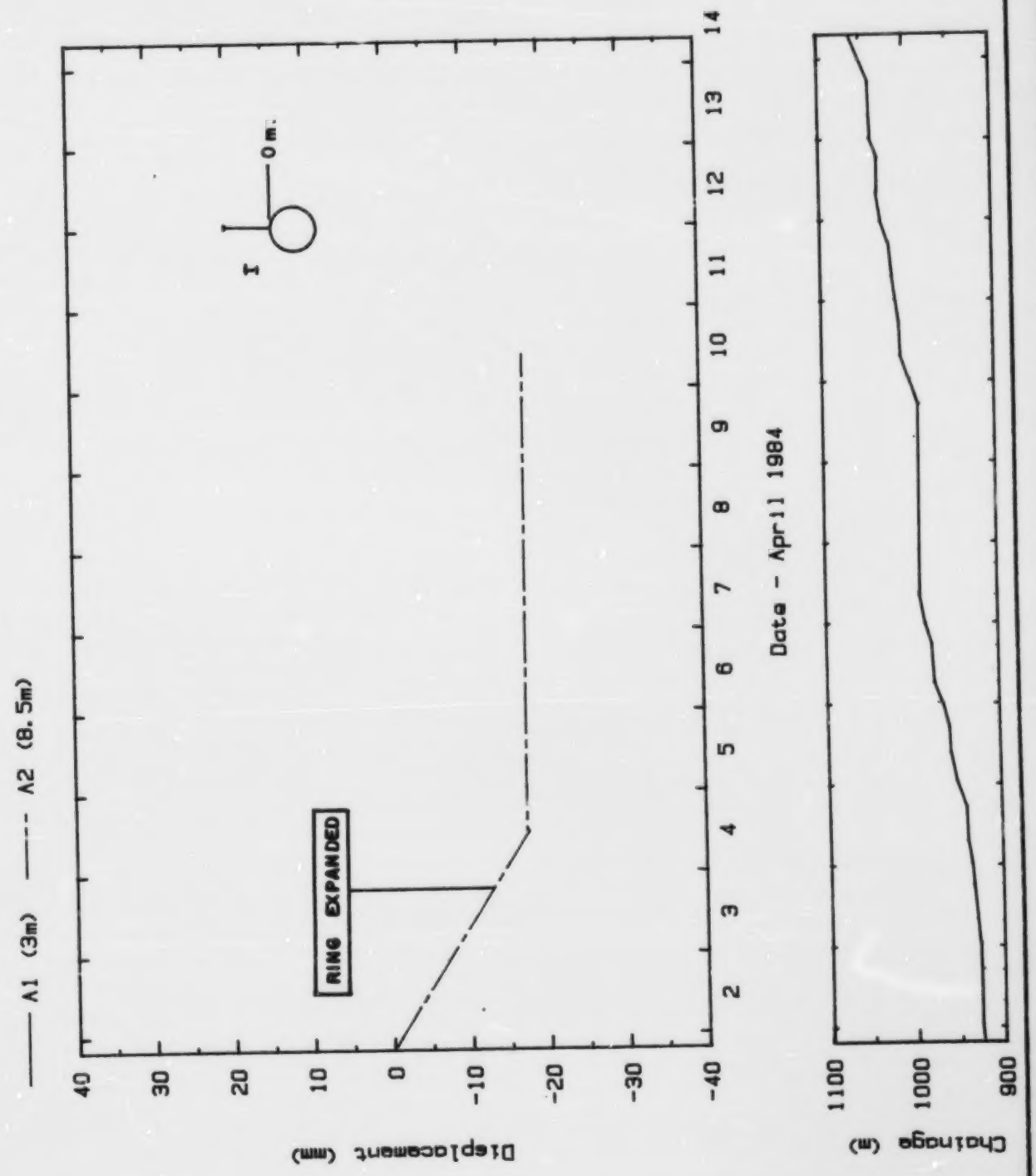
Drawn JLG

Chkd. JJC

RIGID PROBE EXTENSOMETER

2T925EA - Vertical up - ch. 925m

FIGURE C.3



Date April 1985

Project No. 831-6014

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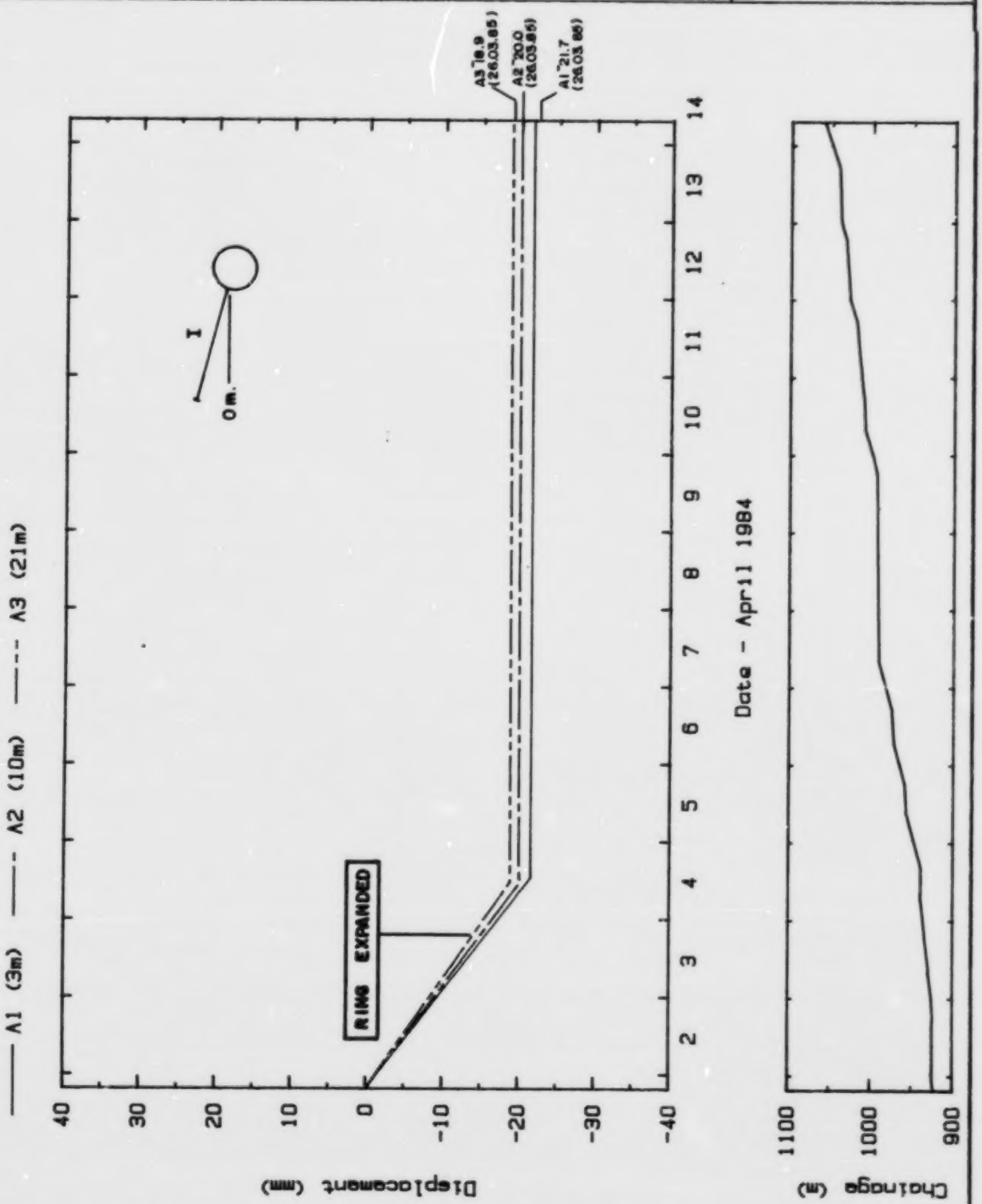
Chkd.

RIGID PROBE EXTENSOMETER

2T925EB - Horizontal - ch. 925m

FIGURE C.4



Date April 1985

Project No. 831-6014

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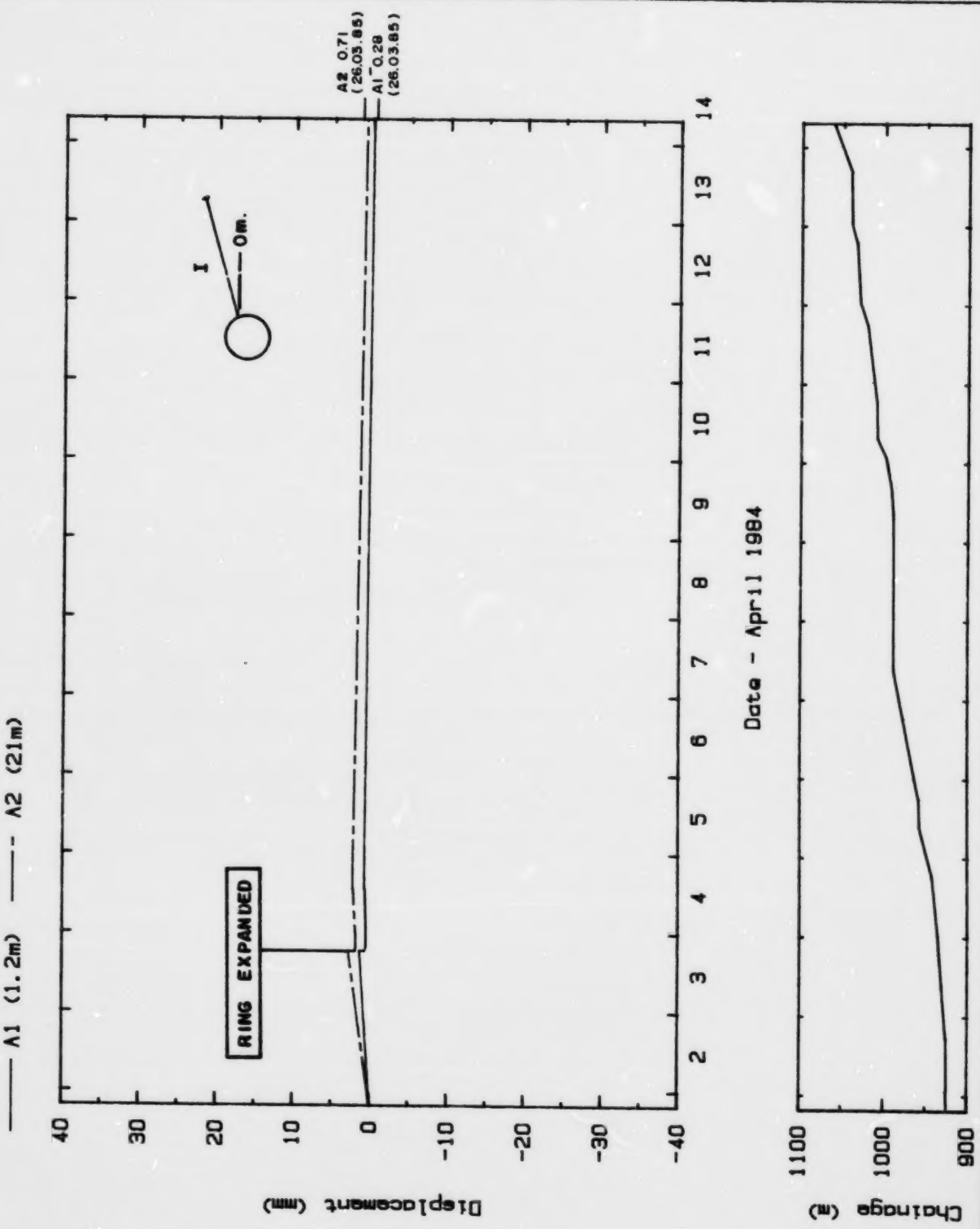
Chkd.

RIGID PROBE EXTENSOMETER

2T925EC - Horizontal - ch. 925m

FIGURE C.5



Date April 1985

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Chkd.

RIGID PROBE EXTENSOMETER

2T920ED - Vertical down - ch. 920m

FIGURE C.6

Date April 1985

Project No. 831-6014

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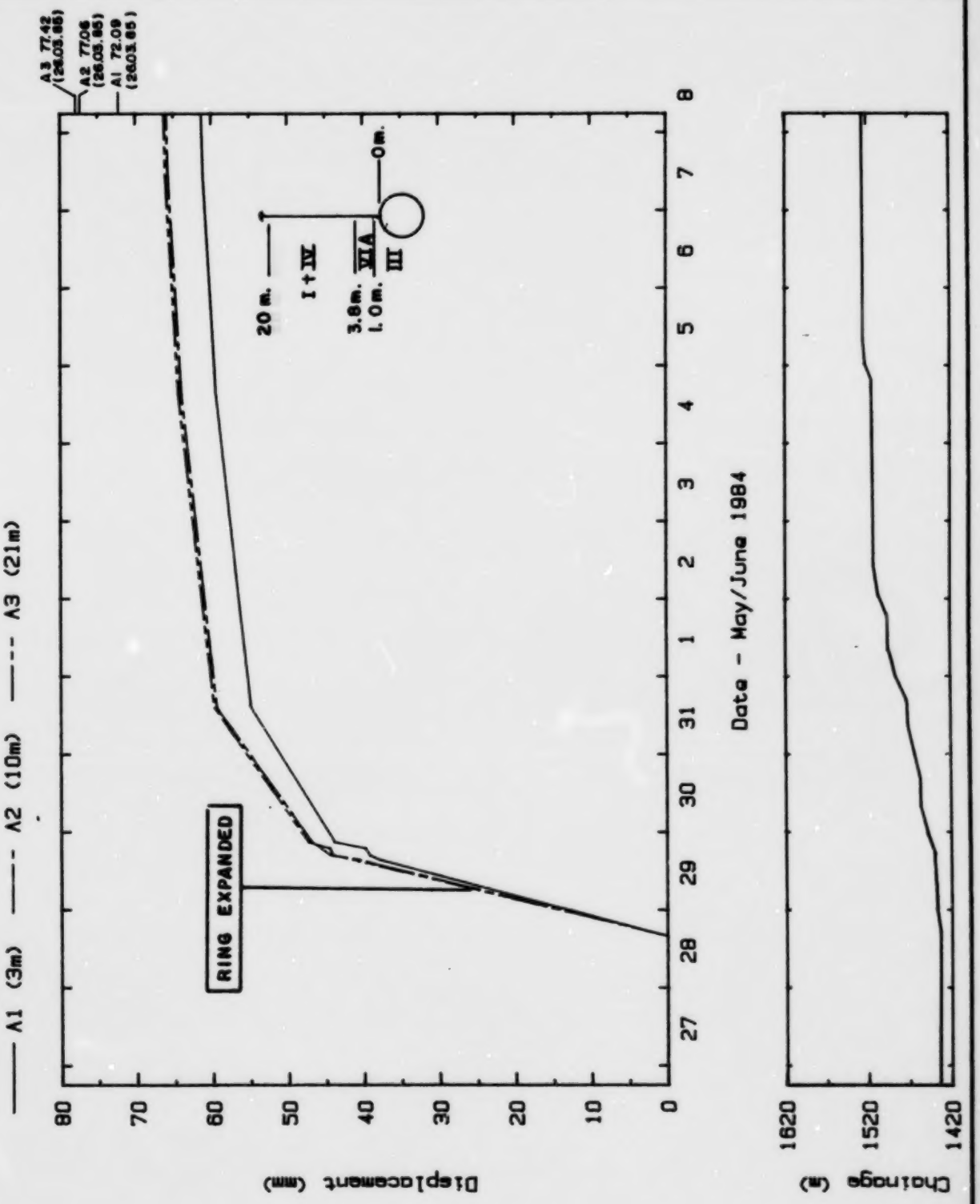
Chkd. JG

RIGID PROBE EXTENSOMETER

2T1428EA - Vertical up - ch. 1427.97m

FIGURE C.7



Date April 1985

Project No. 831-6014

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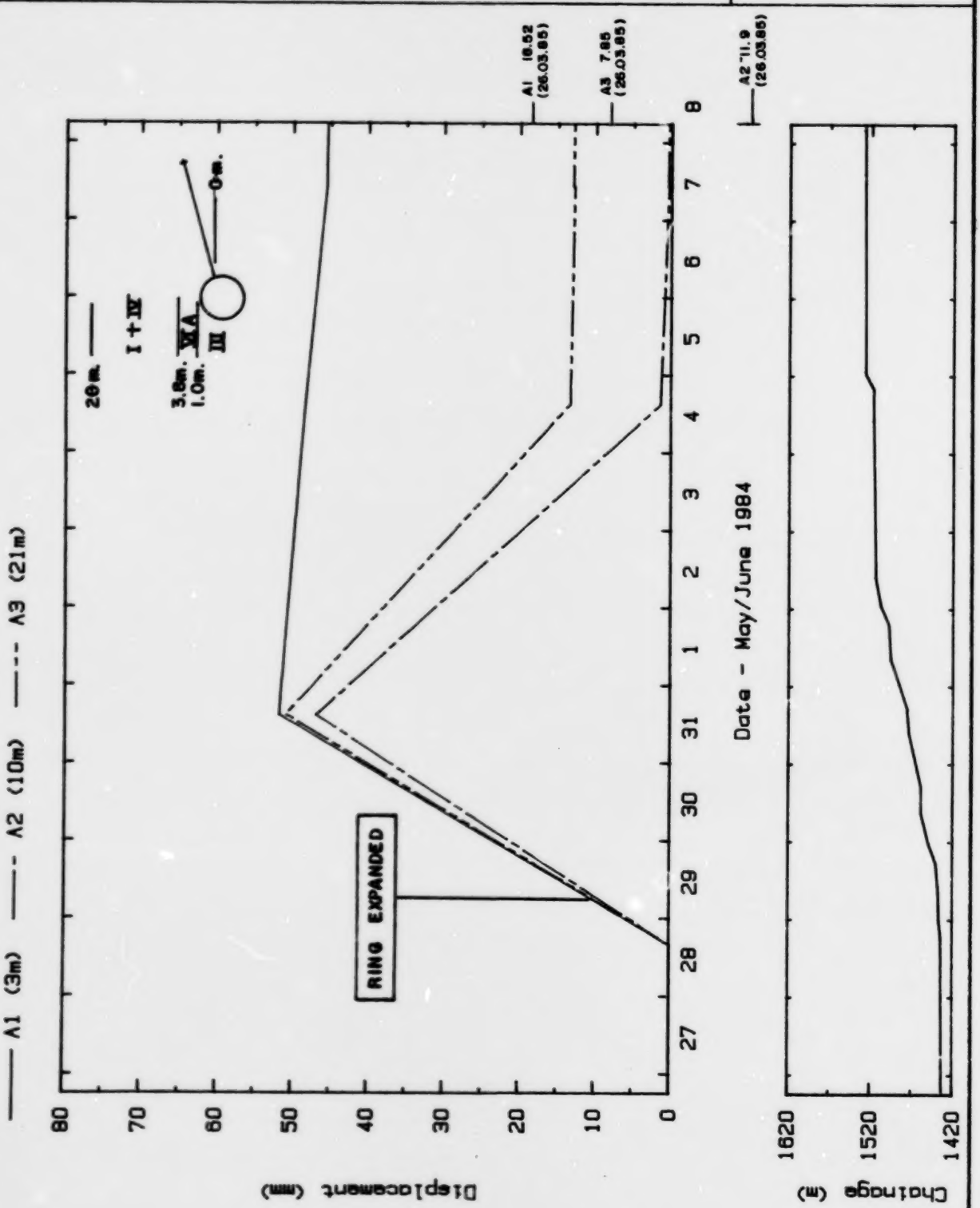
Drawn JLC

Chkd. JJF

RIGID PROBE EXTENSOMETER

2T1428EC - Horizontal - ch. 1427.97m

FIGURE C.8



Date April 1985

Project No. 831-6014

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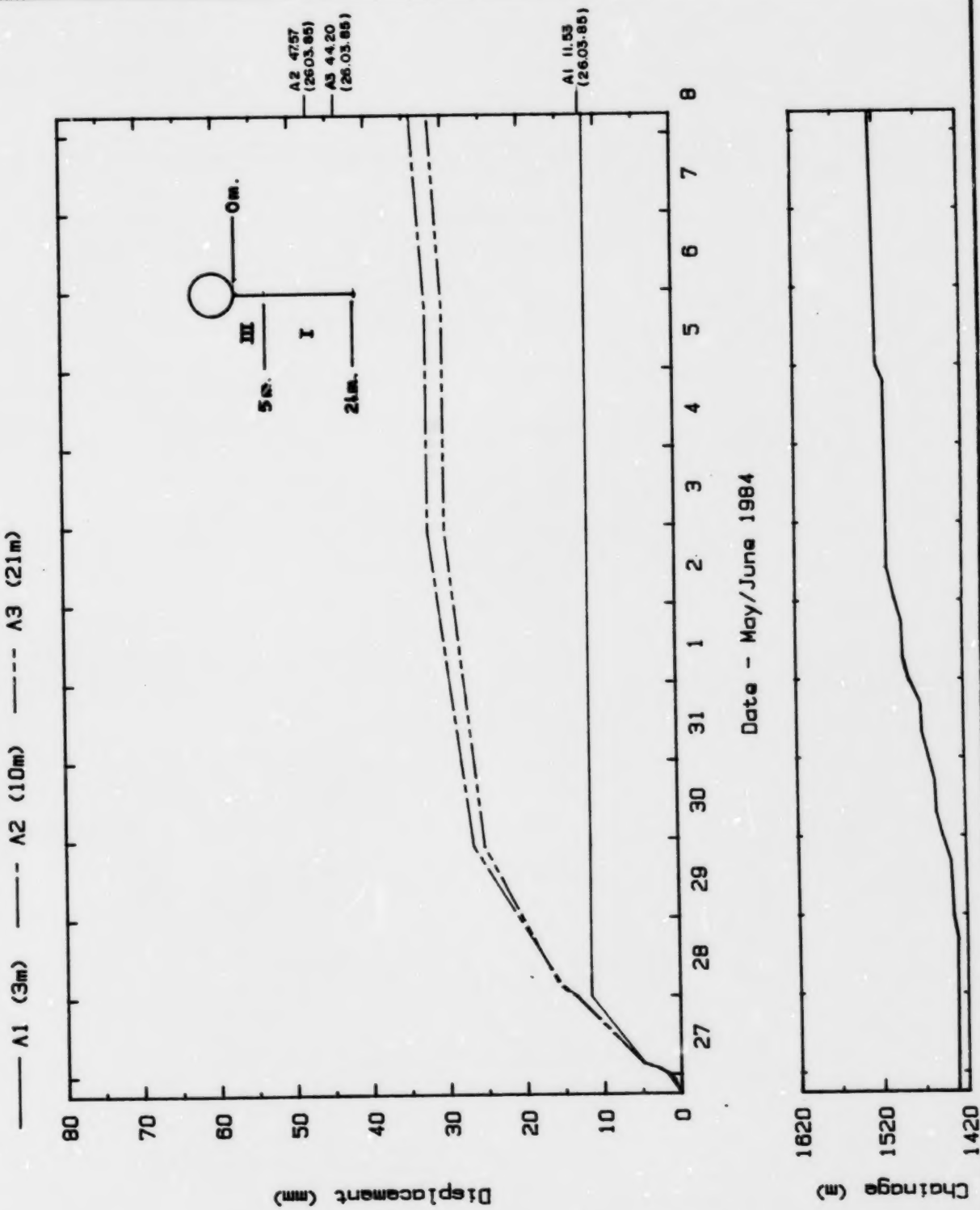
Drawn JLG

Chkd. JLG

RIGID PROBE EXTENSOMETER

2T1420ED - Vertical down - ch. 1420m

FIGURE C.9



Date April 1985

Project No. 831-6014

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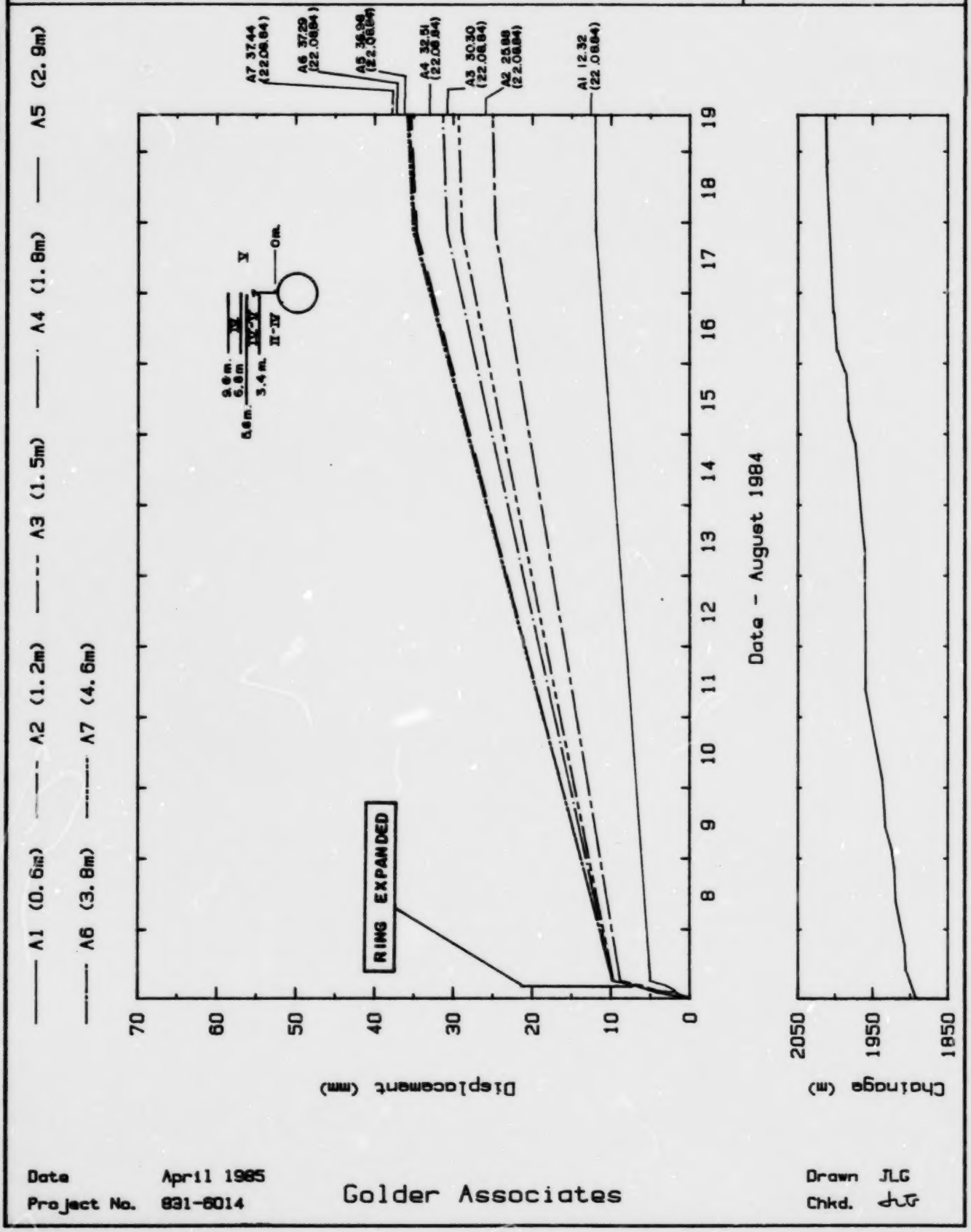
Drawn JLG

Chkd. JLG

FLEXIBLE PROBE EXTENSOMETER

2T1889EA - Vertical up - ch. 1889m

FIGURE C.10



Date April 1985

Project No. 831-6014

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Chkd.

FLEXIBLE PROBE EXTENSOMETER

2T1889EB - West haunch - ch. 1889m

FIGURE C.11

Date April 1985

Project No. 831-6014

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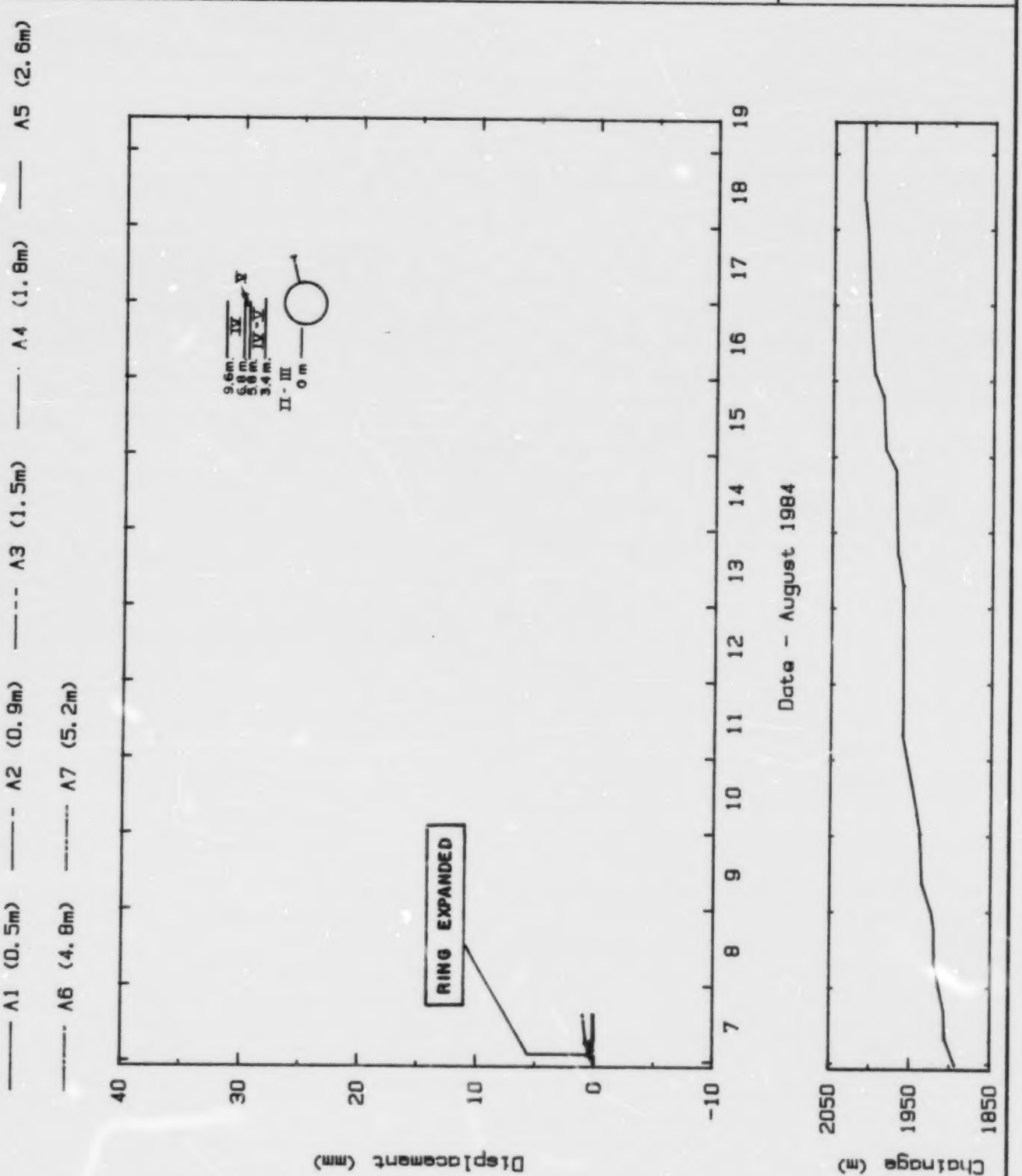
Drawn JLG

Chkd. JLG

FLEXIBLE PROBE EXTENSOMETER

2T1889EC - East haunch - ch. 1889m

FIGURE C.12



Date April 1985

Project No. 831-6014

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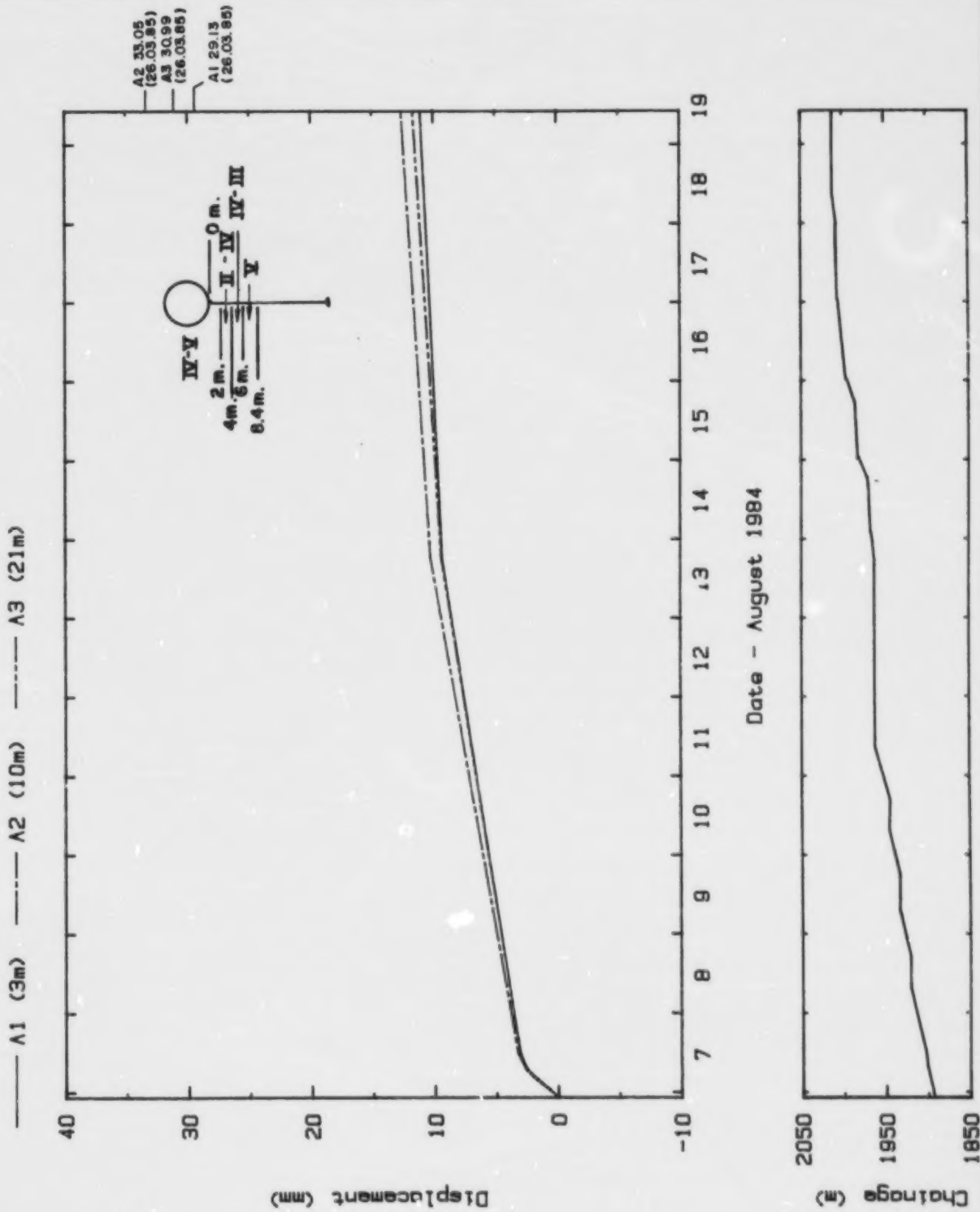
Drawn JLG

Chkd.

RIGID PROBE EXTENSOMETER

2T1881ED - Vertical down - ch. 1881m

FIGURE C.13



Date April 1985

Project No. 831-6014

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Drawn JLG

Chkd. JLG

FLEXIBLE PROBE EXTENSOMETER

2T2263EA - Vertical up - ch. 2263m

FIGURE C.14

Date April 1985

Project No. 831-6014

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Drawn JLG

Chkd.

FLEXIBLE PROBE EXTENSOMETER

2T2433EA - Vertical up - ch. 2433m

FIGURE C.15

Date April 1985

Project No. 631-6014

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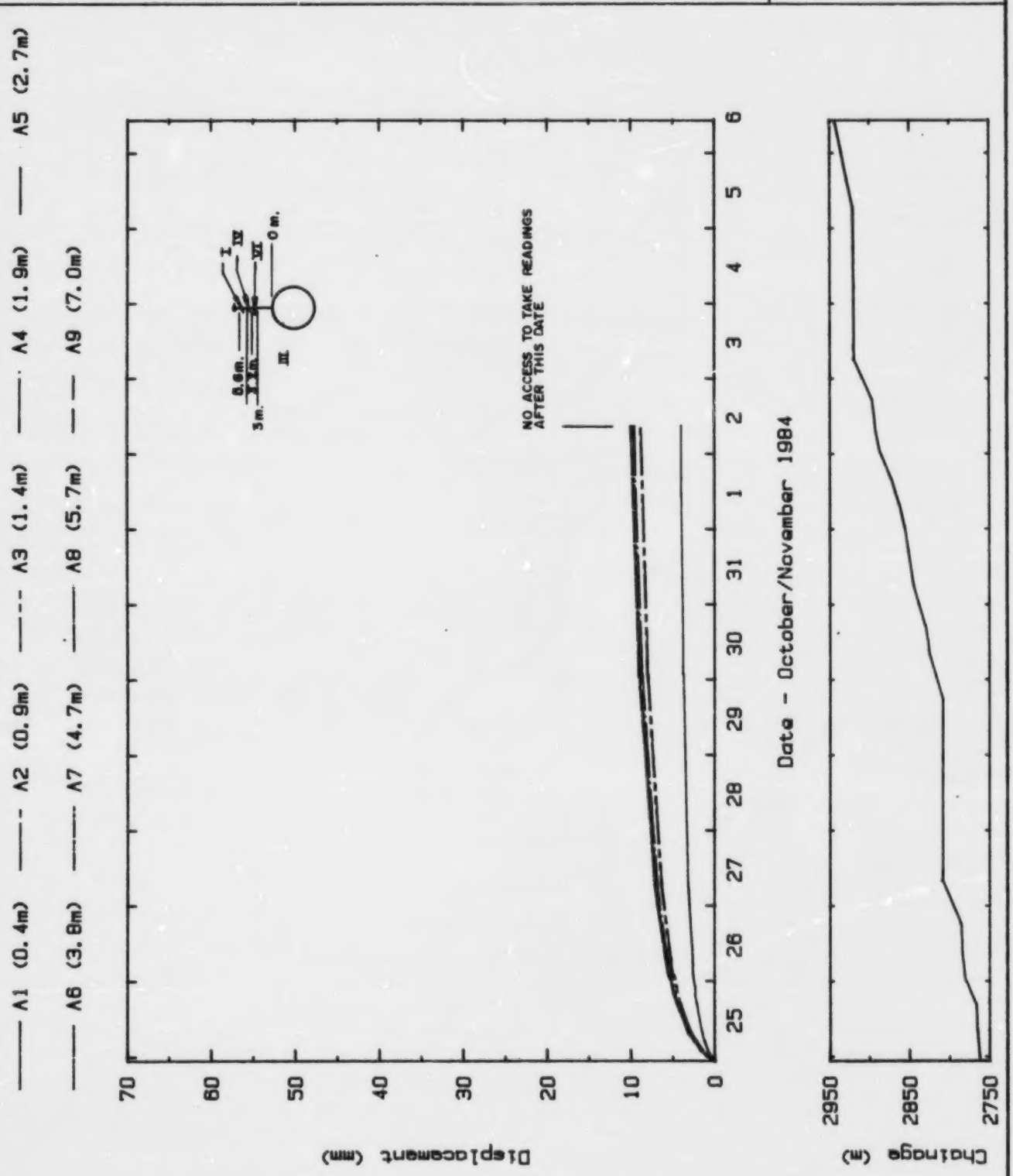
Drawn JLG

Chkd.

FLEXIBLE PROBE EXTENSOMETER

2T2749EA - Vertical up - ch. 2749m

FIGURE C.16



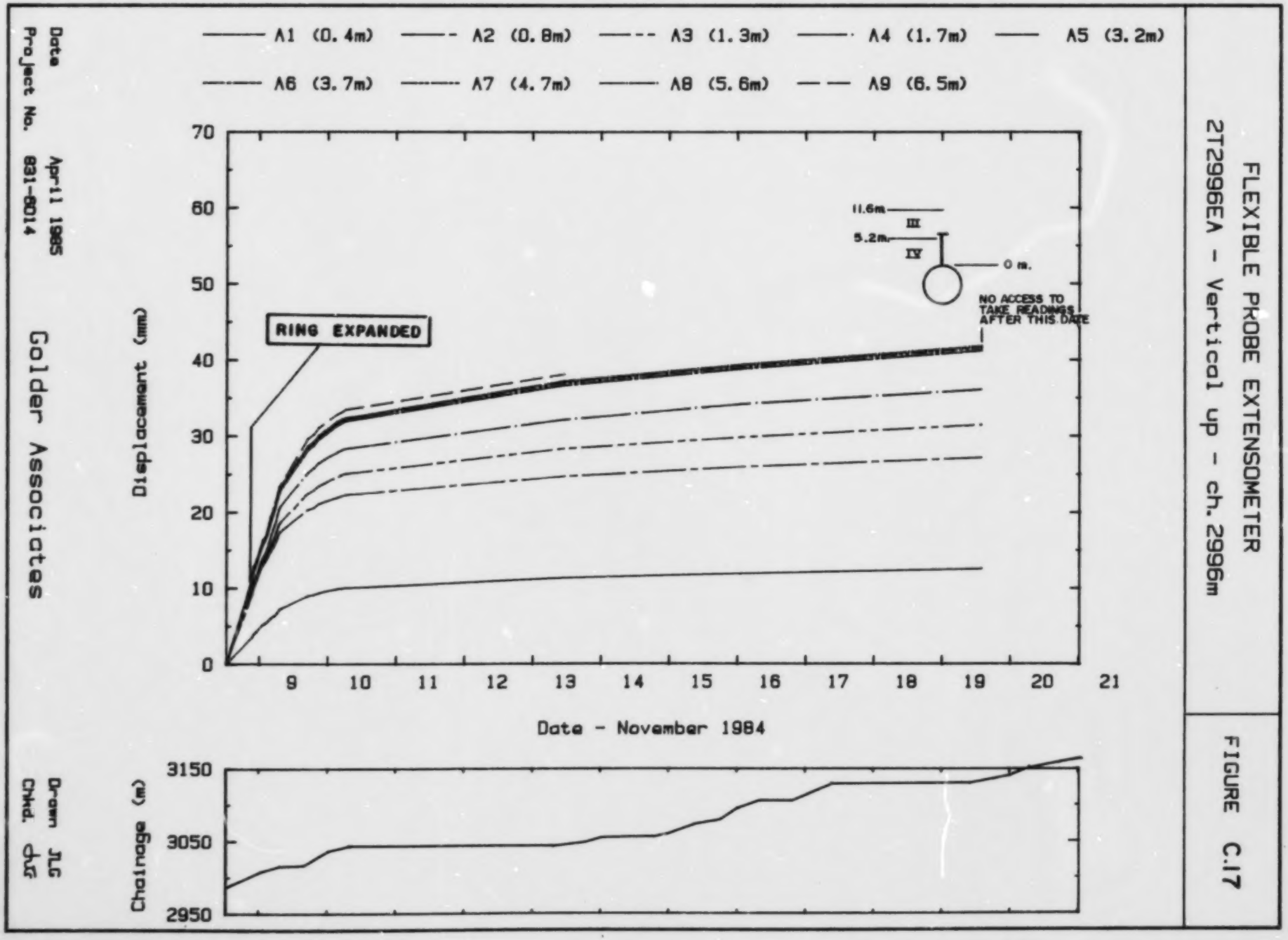
Date April 1985

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JLG



FLEXIBLE PROBE EXTENSOMETER

2T2996EA - Vertical up - ch. 2996m

FIGURE C.17

Date April 1985

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. CHG

FLEXIBLE PROBE EXTENSOMETER

2T3205EA - Vertical up - ch. 3205m

FIGURE C.18

Date April 1985

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd.

FLEXIBLE PROBE EXTENSOMETER

2T3385EA - Vertical up - ch. 3385m

FIGURE C.19

Date April 1985

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JJF

FLEXIBLE PROBE EXTENSOMETER
2T3457EA - Vertical up - ch. 3457m

FIGURE C.20

Date April 1985
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd.

FLEXIBLE PROBE EXTENSOMETER

2T3522EA - Vertical up - ch. 3522m

FIGURE C.21

Date April 1985
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd.

FLEXIBLE PROBE EXTENSOMETER

2T3575EA - Vertical up - ch. 3575m

FIGURE C.22

Date April 1985

Project No. 831-8014

Golder Associates

Drawn JLG

Chkd. dJG.

APPENDIX C-2

THRUST BLOCK LOADING
DATA AND PLOTS

Reduction of Thrust Block Loading Data

The following data tables include instrument number, tunnel number, chainage, date installed and datum readings as the first reading column. The thrust block instrument reference number is typically designated as T1A

where T1 - Thrust block number corresponding to the push cylinder number on the TBM (see Figure I-5.1)

A - Location A - Upper side of thrust block
B - Lower side of thrust block

For each set of readings the date, time and chainage of the tunnel are shown as well as the raw data under the reading column and the difference under Diff column (period readings).

$$\text{Diff} = r_o - r_1$$

where r_o = datum reading (microstrains)
r_1 = reading taken on date shown (microstrains)

For all readings, positive values are compressive and negative values tensile.

The expression for calculating the thrust loads from the strains is as follows:

$P = 2E\ a\ t\ (S1 + S2)$ (kN)

E = modulus = 206 GPa

a = size of thrust block
= 93.7 mm

t = thickness of thrust block
= 7.9 mm

$S1, S2$ = top and bottom strains (microstrains)

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	16.45	9.04	17.05	9.04	17.25	9.04	17.38	9.04	17.55
Tunnel ch.	989.70	989.70		990.50		990.70		991.00		991.20	
T 1A	2048	1964	84	1969	79	1964	84	1964	84	1888	160
T 1B	1910	1775	135	1774	136	1780	130	1773	137	1804	106
T 4A	2178	2021	157	2010	168	1987	191	1996	182	1925	253
T 4B	2100	-	-	-	-	-	-	-	-	-	-
T 5A	2065	2173	-88	-	-	-	-	-	-	2014	71
T 5B	2549	2312	237	2322	227	2323	226	-	-	-	-
T 8A	2388	2376	12	2328	60	2324	64	2318	70	2195	193
T 8B	2099	1654	445	-	-	-	-	-	-	-	-
T 9A	1988	1938	50	1927	61	1928	60	1926	62	1917	71
T 9B	2123	1818	305	1839	284	1845	278	1842	281	1877	246
T12A	2123	2044	79	1898	225	1893	230	1883	240	1859	264
T12B	1822	1109	713	1151	671	1187	635	1190	632	1384	438

Comments: Datum — Ram pressure 1900psi +/- 50. Rams in use 1, 2, 10, 13 to 24

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	18.10	9.04	18.30	9.04	19.00	9.04	19.15	9.04	19.30
Tunnel ch.	989.70	991.20		991.40		992.20		992.50		992.70	
T 1A	2048	2057	-9	2025	23	2002	46	2004	44	2028	20
T 1B	1910	1909	1	1885	25	1886	24	1885	25	1873	37
T 4A	2178	2185	-7	1976	202	1976	202	1998	180	2040	138
T 4B	2100	2103	-3	-	-	-	-	-	-	1780	320
T 5A	2085	1997	88	-	-	-	-	-	-	-	-
T 5B	2549	2675	-126	2565	-16	2565	-16	2578	-29	2468	81
T 8A	2388	2297	91	2190	198	2176	212	2171	217	2066	322
T 8B	2099	2198	-99	-	-	1818	281	1828	271	1977	122
T 9A	1988	1933	55	1726	262	1735	253	1705	283	1526	462
T 9B	2123	2185	-62	1670	453	1679	444	1666	457	1906	217
T12A	2123	2130	-7	1750	373	1750	373	1754	369	1455	668
T12B	1822	1853	-31	1329	493	1329	493	1313	509	1554	268
Comments	Datum	No load									

Notes: Readings taken while TBM driving unless otherwise noted in comments

Dankin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	19.48	9.04	20.40	9.04	21.30	9.04	22.30	9.04	23.00
Tunnel ch.	989.70	992.70		993.00		994.20		995.20		995.70	
T 1A	2048	2039	9	2009	39	1998	50	2026	22	2017	31
T 1B	1910	1926	-16	1841	69	1897	13	1862	48	1865	45
T 4A	2178	2201	-23	1935	243	1741	437	1883	295	1872	306
T 4B	2100	2108	-8	1524	576	1844	256	1967	133	1972	128
T 5A	2085	2093	-8	-	-	2136	-51	2149	-64	2147	-62
T 5B	2549	-	-	2463	86	2508	41	2488	61	2500	49
T 8A	2388	2285	103	1935	453	2251	137	2339	49	2337	51
T 8B	2099	2150	-51	1349	750	1329	770	1628	471	1708	391
T 9A	1988	1902	86	1352	636	1936	52	1918	70	1925	63
T 9B	2123	2048	75	1466	657	1544	579	1421	702	1387	736
T12A	2123	1845	278	1726	397	2039	84	1904	219	2072	51
T12B	1822	1727	95	1338	484	1630	192	1194	628	1647	175
Comments	Datum	No load setting ribs				Static load - head not turning				Static load - head not turning	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section
Date installed 09/04/84 Tunnel No. 2 Chainage 984 m
Sheet 4

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	23.03	9.04	23.35	10.04	14.23	10.04	16.30	10.04	17.20
Tunnel ch.	989.70	995.70		996.00		1004.75		1004.80		1006.20	
T 1A	2048	2046	2	2014	34	2043	5	2012	36	2008	40
T 1B	1910	1922	-12	1866	44	1907	3	1866	44	1865	45
T 4A	2178	2202	-24	1906	272	2201	-23	2001	177	1961	217
T 4B	2100	2117	-17	1933	167	2111	-11	2007	93	1986	114
T 5A	2085	2126	-41	2138	-53	2105	-20	2123	-38	2127	-42
T 5B	2549	2541	8	2504	45	2548	1	2507	42	2503	46
T 8A	2388	2359	29	2360	28	2366	22	2369	19	2368	20
T 8B	2099	2082	17	1620	479	2063	36	1703	396	1682	417
T 9A	1988	2025	-37	1913	75	2062	-74	1817	171	1780	208
T 9B	2123	2066	57	1448	675	2074	49	1328	795	1273	850
T12A	2123	2121	2	1904	219	2112	11	1942	181	1944	179
T12B	1822	1840	-18	1133	689	1801	21	1225	597	1236	586
Comments	Datum	No load - setting ribs				No load				Static load - head not turning	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section
Date installed 09/04/84 Tunnel No. 2

Chainage 984 m
Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	11.04	15.00	11.04	15.30	11.04	16.30	11.04	19.25	11.04	22.05
Tunnel ch.	989.70	1019.65		1020.00		1020.62		1023.42		1025.92	
T 1A	2048	2046	2	2009	39	2010	38	2020	28	2021	27
T 1B	1910	1908	2	1859	51	1860	50	1874	36	1874	36
T 4A	2178	2203	-25	1867	311	1832	346	2038	140	2027	151
T 4B	2100	2112	-12	1919	181	1899	201	2030	70	2030	70
T 5A	2085	2105	-20	2110	-25	2111	-26	2122	-37	2117	-32
T 5B	2549	2548	1	2526	23	2528	21	2516	33	2527	22
T 8A	2388	2364	24	2292	96	2285	103	2371	17	2362	26
T 8B	2099	2057	42	1438	661	1424	675	1694	405	1669	430
T 9A	1988	2067	-79	1964	24	1976	12	1860	128	1948	40
T 9B	2123	1993	130	1604	519	1631	492	1433	690	1600	523
T12A	2123	2405	-282	1903	220	1912	211	1942	181	1912	211
T12B	1822	1734	88	1281	541	1300	522	1273	549	1259	563
		No load									
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section
Date installed 09/04/84 Tunnel No. 2 Chainage 984 m
Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	12.04	7.10	12.04	17.15	12.04	21.10	13.04	3.35	13.04	7.22
Tunnel ch.	987.70	1029.00		1030.80		1033.70		1039.26		1042.84	
T 1A	2048	2050	-2	2052	-4	2053	-5	2055	-7	2054	-6
T 1B	1910	1908	2	1913	-3	1914	-4	1914	-4	1919	-9
T 4A	2178	2212	-34	2213	-35	2212	-34	2213	-35	2212	-34
T 4B	2100	2109	-9	2111	-11	2113	-13	2111	-11	2114	-14
T 5A	2085	2107	-22	2113	-28	2115	-30	2117	-32	2116	-31
T 5B	2549	2544	5	2546	3	2545	4	2546	3	2548	1
T 8A	2388	2368	20	2371	17	2373	15	2374	14	2375	13
T 8B	2099	2071	28	2074	25	2075	24	2075	24	2075	24
T 9A	1988	2076	-88	2077	-89	2075	-87	2078	-90	2079	-91
T 9B	2123	2014	109	2015	108	1950	173	1941	182	1941	182
T12A	2123	2100	23	2097	26	2100	23	2099	24	2100	23
T12B	1822	1738	84	1733	89	1738	84	1744	78	1746	76

Comments: Datum

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	13.04	16.45	13.04	20.45	14.04	5.18	14.04	7.08	16.04	17.00
Tunnel ch.	989.70	1045.80		1049.00		1058.00		1060.00		1061.80	
T 1A	2048	2050	-2	2047	1	2051	-3	2051	-3	2056	-8
T 1B	1910	1927	-17	1928	-18	1935	-25	1934	-24	1934	-24
T 4A	2178	2213	-35	2212	-34	2211	-33	2211	-33	2211	-33
T 4B	2100	-	-	-	-	2115	-15	2114	-14	2119	-19
T 5A	2085	2123	-38	2125	-40	2132	-47	2132	-47	2134	-49
T 5B	2549	2545	4	2553	-4	2545	4	2545	4	2549	0
T 8A	2388	2379	9	2381	7	2384	4	2384	4	2388	0
T 8B	2099	-	-	-	-	2076	23	2077	22	2076	23
T 9A	1988	-	-	-	-	2081	-93	2082	-94	2081	-93
T 9B	2123	1958	165	1953	170	1953	170	1951	172	1964	159
T12A	2123	2100	23	2099	24	2101	22	2100	23	2100	23
T12B	1822	1754	68	1755	67	1753	69	1752	70	1758	64
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 a
Date installed 09/04/84 — Tunnel No. 2 — Sheet 8

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	17.04	18.00	18.04	2.00	18.04	18.30	19.04	1.10	19.04	19.00
Tunnel ch.	989.70	1079.50		1086.00		1093.00		1098.00		1112.00	
T 1A	2048	2056	-8	2056	-8	2055	-7	2055	-7	2056	-8
T 1B	1910	1933	-23	1931	-21	1937	-27	1938	-28	1944	-34
T 4A	2178	2210	-32	2210	-32	2210	-32	2210	-32	2212	-34
T 4B	2100	2119	-19	2218	-118	2119	-19	2119	-19	2118	-18
T 5A	2085	2138	-53	2141	-56	2140	-55	2141	-56	2142	-57
T 5B	2549	2550	-1	2550	-1	2549	0	2549	0	2549	0
T 8A	2388	2394	-6	2399	-11	2400	-12	2400	-12	2406	-18
T 8B	2099	2074	25	2071	28	2069	30	2070	29	2071	28
T 9A	1988	2074	-86	2071	-83	2074	-86	2075	-87	2076	-88
T 9B	2123	1950	173	1944	179	1957	166	1959	164	1964	159
T12A	2123	2099	24	2096	27	2098	25	2099	24	2100	23
T12B	1822	1747	75	1736	86	1747	75	1748	74	1751	71
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 9

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	20.04	1.30	23.04	22.45	24.04	6.00	24.04	23.04	25.04	3.00
Tunnel ch.	989.70	1117.40		1128.50		1133.30		1145.00		1149.50	
T 1A	2048	2055	-7	2056	-8	2057	-9	2057	-9	2057	-9
T 1B	1910	1946	-36	1947	-37	1947	-37	1947	-37	1947	-37
T 4A	2178	2213	-35	2213	-35	2212	-34	2211	-33	2211	-33
T 4B	2100	2118	-18	2118	-18	2120	-20	2120	-20	2119	-19
T 5A	2085	2140	-55	2142	-57	2143	-58	2145	-60	2145	-60
T 5B	2549	2549	0	2552	-3	2552	-3	2553	-4	2553	-4
T 8A	2388	2408	-20	2413	-25	2414	-26	2418	-30	2418	-30
T 8B	2099	2070	29	2073	26	2073	26	2074	25	2074	25
T 9A	1988	2077	-89	2079	-91	2078	-90	2076	-88	2075	-87
T 9B	2123	1967	156	1975	148	1972	151	1965	158	1964	159
T12A	2123	2100	23	2101	22	2099	24	2099	24	2099	24
T12B	1822	1753	69	1755	67	1752	70	1748	74	1747	75
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 10

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	26.04	1.00	26.04	10.00	4.05	10.00	7.06	11.00	30.07	10.00
Tunnel ch.	989.70	1161.90		1169.15		1254.74		1522.35		1817.45	
T 1A	2048	2057	-9	2056	-8	2058	-10	2072	-24	2090	-42
T 1B	1910	1947	-37	1956	-46	1984	-74	2065	-155	2118	-208
T 4A	2178	2211	-33	2210	-32	2215	-37	2260	-82	2268	-90
T 4B	2100	2119	-19	2118	-18	2120	-20	-	-	2123	-23
T 5A	2085	2144	-59	2146	-61	2155	-70	2246	-161	2294	-209
T 5B	2549	2553	-4	2550	-1	2552	-3	2598	-49	2619	-70
T 8A	2388	2420	-32	2424	-36	2441	-53	2510	-122	2543	-155
T 8B	2099	2070	29	2075	24	2093	6	2230	-131	2309	-210
T 9A	1988	2073	-85	2078	-90	2081	-93	2074	-86	2087	-99
T 9B	2123	1962	161	1972	151	1980	143	2105	18	2096	27
T12A	2123	2099	24	2099	24	2104	19	2130	-7	2142	-19
T12B	1822	1745	77	1753	69	1747	75	1751	71	1725	97
				No load		No load		No load		No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Upper Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 11

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	28.11	1.00	20.02	12.00						
Tunnel ch.	989.70	3292.08		3579.78	1985						
T 1A	2048	2109	-61	2115	-67						
T 1B	1910	2205	-295	2210	-300						
T 4A	2178	2292	-114	2291	-113						
T 4B	2100	2116	-16	2112	-12						
T 5A	2085	2370	-285	2376	-291						
T 5B	2549	2599	-50	2623	-74						
T 8A	2388	2543	-155	2533	-145						
T 8B	2099	2473	-374	2488	-389						
T 9A	1988	2098	-110	2099	-111						
T 9B	2123	2173	-50	2100	23						
T12A	2123	2150	-27	2140	-17						
T12B	1822	1743	79	1755	67						
Comments	Datum	No load		No load							

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section
Date installed 09/04/84 Tunnel No. 2

Chainage 984 m
Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	16.45	9.04	17.05	9.04	17.25	9.04	17.38	9.04	17.55
Tunnel ch.	989.70	989.70		990.50		990.70		991.00		991.20	
T13A	1698	1512	186	1517	181	1508	190	1509	189	1467	231
T13B	1964	1401	563	1432	532	1430	534	1436	528	1458	506
T14A	1975	2101	-126	1869	106	1865	110	1844	131	-	-
T14B	1955	840	1115	973	982	996	959	1017	938	1120	835
T15A	1925	1725	200	1679	246	1664	261	1670	255	1608	317
T15B	1943	1228	715	1234	709	1265	678	1253	690	1326	617
T16A	2321	2116	205	2058	263	2016	305	2031	290	1908	413
T16B	2151	1261	890	1295	856	1306	845	1324	827	1416	735
T17A	2182	1480	702	1358	824	1388	794	1365	817	1440	742
T17B	2026	1454	572	1434	592	1465	561	1438	588	1562	464
T18A	2121	1806	315	1157	964	1610	511	1606	515	1603	518
T18B	1819	836	983	1004	815	1025	794	1022	797	1064	755
T19A	2029	1148	881	957	1072	970	1059	971	1058	719	1310
T19B	1905	1456	449	1575	330	1561	344	1578	327	1644	261
T20A	1825	1247	578	1237	588	1228	597	1225	600	1308	517
T20B	1950	1304	646	1293	657	1291	659	1286	664	1288	662
T21A	2151	1196	955	1234	917	1232	919	1218	933	1172	979
T21B	1848	1468	380	1407	441	1407	441	1413	435	1452	396
T22A	2164	1462	702	1452	712	1447	717	1461	703	1477	687
T22B	1883	878	1005	880	1003	873	1010	880	1003	894	989
T23A	1830	1137	693	1120	710	1218	612	1211	619	1219	611
T23B	2029	1501	528	1535	494	1544	485	1520	509	1542	487
T24A	2227	1870	357	1838	389	1845	382	1840	387	1803	424
T24B	1767	1768	-1	1765	2	1785	-18	1765	2	1773	-6
Comments	Datum	Ram pressure 1900psi +/- 50 Rams in use 1, 2, 10, 13 to 24									

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	18.10	9.04	18.30	9.04	19.00	9.04	19.15	9.04	19.30
Tunnel ch.	989.70	991.20		991.40		992.20		992.50		992.70	
T13A	1698	1646	52	1273	425	1264	434	1285	413	1700	-2
T13B	1964	2047	-83	1457	507	1469	495	1459	505	-	-
T14A	1975	1931	44	-	-	-	-	-	-	-	-
T14B	1955	2022	-67	1159	796	1162	793	1146	809	1282	673
T15A	1925	1935	-10	1470	455	1442	483	1428	497	1438	487
T15B	1943	1953	-10	1582	361	1585	358	1594	349	1563	380
T16A	2321	2306	15	1946	375	1911	410	1908	413	1831	490
T16B	2151	2186	-35	1379	772	1378	773	1379	772	1516	635
T17A	2182	2170	12	1240	942	1267	915	1296	886	1494	688
T17B	2026	2040	-14	1757	269	1721	305	1682	344	1490	536
T18A	2121	2124	-3	1663	458	1613	508	1586	535	1594	527
T18B	1819	1843	-24	1167	652	1212	607	1212	607	1280	539
T19A	2029	1896	133	1153	876	1151	878	1134	895	1255	774
T19B	1905	1946	-41	-	-	1317	588	1292	613	1219	686
T20A	1825	1827	-2	1658	167	1615	210	1610	215	1556	269
T20B	1950	1943	7	1295	655	1358	592	1250	700	1313	637
T21A	2151	2164	-13	-	-	-	-	-	-	1589	562
T21B	1848	1855	-7	1185	663	1118	730	1076	772	1843	5
T22A	2164	2111	53	1882	282	1848	316	1840	324	1808	356
T22B	1883	1775	108	1005	878	1050	833	1839	44	1136	747
T23A	1830	1831	-1	1315	515	1343	487	1385	445	1396	434
T23B	2029	2085	-56	1243	786	1220	809	1168	861	1186	843
T24A	2227	2323	-96	1695	532	1661	566	1195	1032	1662	565
T24B	1767	1767	0	1766	1	1764	3	1767	0	1765	2
		No load									
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section
Date installed 09/04/84 Tunnel No. 2

Chainage 984 m
Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	19.48	9.04	20.40	9.04	21.30	9.04	21.45	9.04	22.30
Tunnel ch.	989.70	992.70		993.00		994.20		994.20		995.20	
T13A	1698	1613	85	1337	361	1491	207	1689	9	1481	217
T13B	1964	2092	-128	1492	472	1240	724	1971	-7	1240	724
T14A	1975	1976	-1	-	-	2021	-46	1986	-11	1902	73
T14B	1955	1992	-37	1028	927	1777	178	1957	-2	879	1076
T15A	1925	1862	63	1610	315	1659	266	1904	21	1684	241
T15B	1943	2017	-74	1411	532	1264	679	1982	-39	1243	700
T16A	2321	-	-	2027	294	2311	10	2315	6	2048	273
T16B	2151	2195	-44	1380	771	2057	94	2182	-31	1236	915
T17A	2182	2071	111	1646	536	1691	491	2123	59	1702	480
T17B	2026	2067	-41	1488	538	1299	727	2011	15	1315	711
T18A	2121	2124	-3	1698	423	2123	-2	2129	-8	1749	372
T18B	1819	1843	-24	1132	687	1646	173	1836	-17	1035	784
T19A	2029	1893	136	1398	631	1373	656	1900	129	1375	654
T19B	1905	1925	-20	1319	586	1044	861	1939	-34	1144	761
T20A	1825	1812	13	1590	235	1726	99	1824	1	1558	267
T20B	1950	1966	-16	1274	676	1461	489	1624	326	1163	787
T21A	2151	2148	3	1538	613	1601	550	1926	225	1689	462
T21B	1848	1853	-5	1141	707	929	919	1376	472	953	895
T22A	2164	2113	51	1860	304	1777	387	2016	148	1681	483
T22B	1883	1769	114	1043	840	981	902	1447	436	874	1009
T23A	1830	1843	-13	1375	455	1382	448	1638	192	1401	429
T23B	2029	2049	-20	1326	703	1190	839	1544	485	1138	891
T24A	2227	2486	-259	1840	387	1937	290	2222	5	1807	420
T24B	1767	1768	-1	1765	2	1763	4	1774	-7	1765	2
Comments	Datum	No load - setting ribs				Static load - head not turning					

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 4

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	23.00	9.04	23.03	9.04	23.35	10.04	14.23	10.04	16.30
Tunnel ch.	989.70	995.70		995.70		996.00		1004.75		1004.80	
T13A	1698	1516	182	1692	6	1503	195	1684	14	1498	200
T13B	1964	1440	524	1378	586	1214	750	1920	44	1113	851
T14A	1975	2019	-44	1990	-15	1952	23	2012	-37	1988	-13
T14B	1955	1810	145	1951	4	907	1048	1864	91	1073	882
T15A	1925	1671	254	1913	12	1695	230	1899	26	1704	221
T15B	1943	1154	789	1932	11	1201	742	1847	96	1229	714
T16A	2321	2320	1	2316	5	2113	208	2330	-9	2210	111
T16B	2151	2111	40	2142	9	1236	915	2049	102	1418	733
T17A	2182	1678	504	2115	67	1756	426	2067	115	1883	299
T17B	2026	1240	786	1942	84	1349	677	1870	156	1496	530
T18A	2121	2138	-17	2140	-19	1760	361	2111	10	1920	201
T18B	1819	1793	26	1807	12	975	844	1615	204	1163	656
T19A	2029	1315	714	1884	145	1381	648	1874	155	1527	502
T19B	1905	1009	896	1937	-32	1207	698	-	-	-	-
T20A	1825	1797	28	1818	7	1585	240	1830	-5	1632	193
T20B	1950	1681	269	1888	62	1103	847	1732	218	1163	787
T21A	2151	1605	546	2163	-12	1622	529	2201	-50	1753	398
T21B	1848	883	965	1838	10	979	869	1758	90	998	850
T22A	2164	1718	446	2101	63	1718	446	2079	85	-	-
T22B	1883	961	922	1715	168	890	993	1720	163	947	936
T23A	1830	1354	476	1826	4	1374	456	1798	32	1391	439
T23B	2029	1118	911	1997	32	1156	873	1944	85	1129	900
T24A	2227	2030	197	2470	-243	1905	322	2537	-310	1979	248
T24B	1767	1771	-4	1768	-1	1771	-4	1766	1	1762	5
Comments	Datum	Static load - head not turning		No load - setting ribs				No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section — Chainage 984 a
Date installed 09/04/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	10.04	17.20	11.04	15.00	11.04	15.30	11.04	16.30	11.04	19.25
Tunnel ch.	989.70	1006.20		1019.65		1020.00		1020.62		1023.42	
T13A	1698	1530	168	1685	13	1647	51	1645	53	1626	72
T13B	1964	1189	775	1880	84	1615	349	1585	379	1533	431
T14A	1975	2021	-46	2028	-53	2031	-56	2032	-57	2014	-39
T14B	1955	1178	777	1761	194	1359	596	1362	593	1218	737
T15A	1925	1782	143	1882	43	1826	99	1835	90	1814	111
T15B	1943	1403	540	1818	125	1489	454	1508	435	1473	470
T16A	2321	2286	35	2336	-15	2305	16	2310	11	2282	39
T16P	2151	1615	536	1962	189	1708	443	1725	426	1615	536
T17A	2182	1947	235	2060	122	1978	204	1975	207	1960	222
T17B	2026	1655	371	1883	143	1733	293	1734	292	1728	298
T18A	2121	2041	80	2089	32	2024	97	2013	108	2016	105
T18B	1819	1371	448	1578	241	1378	441	1365	454	1330	489
T19A	2029	1692	337	1828	201	1692	337	1671	358	1656	373
T19B	1905	-	-	-	-	-	-	-	-	-	-
T20A	1825	1735	90	1806	19	1713	112	1717	108	1710	115
T20B	1950	1381	569	1611	339	1382	568	1374	576	1350	600
T21A	2151	1894	257	2158	-7	1984	167	1932	219	1927	224
T21B	1848	1173	675	1553	295	1252	596	1168	680	1207	641
T22A	2164	-	-	2071	93	1937	227	1822	342	1845	319
T22B	1883	1049	834	1622	261	1312	571	1147	736	1161	722
T23A	1830	1449	381	1705	125	1593	237	1515	315	1516	314
T23B	2029	1219	810	1710	319	1415	614	1293	736	1305	724
T24A	2227	2107	120	2405	-178	2173	54	2102	125	2092	135
T24B	1767	1768	-1	1765	2	1768	-1	1757	10	1761	6
Comments	Datum	Static load - head not turning		No load							

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	11.04	22.05	12.04	7.00	12.04	17.15	12.04	21.10	13.04	3.25
Tunnel ch.	989.70	1025.92		1029.00		1030.80		1033.70		1039.26	
T13A	1698	1608	90	1696	2	1696	2	1695	3	1697	1
T13B	1964	1507	457	1893	71	1919	45	1919	45	1923	41
T14A	1975	1997	-22	2024	-49	2023	-48	2020	-45	2019	-44
T14B	1955	1203	752	1776	179	1774	181	1804	151	1825	130
T15A	1925	1802	123	1888	37	1893	32	1903	22	1906	19
T15B	1943	1447	496	1800	143	1855	88	1876	67	1883	60
T16A	2321	2284	57	2333	-12	2338	-17	2343	-22	2347	-26
T16B	2151	1603	548	2016	135	2049	102	2097	54	2116	35
T17A	2182	1964	218	2061	121	2093	89	2113	69	2121	61
T17B	2026	1717	309	1885	141	1916	110	1952	74	1961	65
T18A	2121	2002	119	2086	35	2091	30	2102	19	2103	18
T18B	1819	1335	484	1570	249	1622	197	1646	173	1686	133
T19A	2029	1642	387	1832	197	1852	177	1876	153	1886	143
T19B	1905	-	-	-	-	-	-	-	-	-	-
T20A	1825	1704	121	1791	34	1797	28	1808	17	1814	11
T20B	1950	1353	597	1673	277	1698	252	1753	197	1783	167
T21A	2151	1936	215	2170	-19	2176	-25	2190	-39	2214	-63
T21B	1848	1193	655	1558	290	1603	245	1646	202	1696	152
T22A	2164	1817	347	2083	81	2089	75	2096	68	2106	58
T22B	1883	1128	755	1665	218	1659	224	1720	163	1731	152
T23A	1830	1488	342	1725	105	1733	97	1756	74	1762	68
T23B	2029	1261	768	1732	297	1740	289	1788	241	1829	200
T24A	2227	2071	156	2442	-215	2447	-220	2494	-267	2518	-291
T24B	1767	1762	5	1764	3	1765	2	1761	6	1766	1

Comments: Datum

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section
Date installed 09/04/84 Tunnel No. 2

Chainage 984 m
Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	13.04	7.12	13.04	16.45	13.04	20.45	14.04	5.11	14.04	7.03
Tunnel ch.	989.70	1042.84		1045.80		1049.00		1058.00		1060.00	
T13A	1698	1699	-1	1694	4	1698	0	1695	3	1695	3
T13B	1964	1919	45	1930	34	1923	41	1922	42	1922	42
T14A	1975	2019	-44	2018	-43	2021	-46	2024	-49	2024	-49
T14B	1955	1828	127	1840	115	1838	117	1848	107	1846	109
T15A	1925	1906	19	1908	17	1908	17	1912	13	1912	13
T15B	1943	1879	64	1886	57	1883	60	1880	63	1878	65
T16A	2321	2351	-30	2348	-27	2347	-26	2347	-26	2347	-26
T16B	2151	2114	37	2133	18	2126	25	2136	15	2131	20
T17A	2182	2122	60	2112	70	2120	62	2113	69	2114	68
T17B	2026	1962	64	1968	58	1957	69	1950	76	1951	75
T18A	2121	2114	7	2109	12	2109	12	2112	9	2109	12
T18B	1819	1688	131	1706	113	1708	111	1715	104	1713	106
T19A	2029	1883	146	1888	141	1888	141	1893	136	1892	137
T19B	1905	-	-	-	-	-	-	-	-	-	-
T20A	1825	1815	10	1820	5	1821	4	1820	5	1821	4
T20B	1950	1794	156	-	-	-	-	1793	157	1791	159
T21A	2151	2205	-54	2201	-50	2200	-49	2197	-46	2199	-48
T21B	1848	1666	182	1682	166	1679	169	1684	164	1681	167
T22A	2164	2108	56	2107	57	2105	59	2105	59	2105	59
T22B	1883	1725	158	1745	138	1745	138	1748	135	1748	135
T23A	1830	1752	78	1764	66	1758	72	1759	71	1759	71
T23B	2029	1810	219	1848	181	1839	190	1844	185	1842	187
T24A	2227	2523	-296	2466	-239	2466	-239	2469	-242	2468	-241
T24B	1767	1769	-2	-	-	-	-	1760	7	1762	5
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 8

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	16.04	17.00	17.04	18.00	18.04	2.00	18.04	18.30	19.04	1.10
Tunnel ch.	989.70	1061.80		1079.50		1086.00		1093.00		1098.00	
T13A	1698	1694	4	1692	6	1691	7	1689	9	1690	8
T13B	1964	1936	28	1923	41	1914	50	1928	36	1931	33
T14A	1975	2017	-42	2019	-44	2020	-45	2021	-46	2021	-46
T14B	1955	1848	107	1832	123	1820	135	1828	127	1831	124
T15A	1925	1912	13	1911	14	1908	17	1909	16	1911	14
T15B	1943	1878	65	1874	69	1868	75	1875	68	1873	70
T16A	2321	2346	-25	2349	-28	2349	-28	2348	-27	2348	-27
T16B	2151	2126	25	2112	39	2108	43	2116	35	2112	39
T17A	2182	2117	65	2120	62	2119	63	2120	62	2120	62
T17B	2026	1944	82	1932	94	1928	98	1926	100	1925	101
T18A	2121	2114	7	2111	10	2108	13	2109	12	2110	11
T18B	1819	1697	122	1686	133	1684	135	1692	127	1690	129
T19A	2029	1880	149	1879	150	1874	155	1864	165	1861	168
T19B	1905	-	-	-	-	-	-	-	-	-	-
T20A	1825	1828	-3	1831	-6	1830	-5	1828	-3	1826	-1
T20B	1950	1790	160	1781	169	1775	175	1780	170	1780	170
T21A	2151	2212	-61	2212	-61	2212	-61	2214	-63	2213	-62
T21B	1848	1708	140	1700	148	1692	156	1687	161	1689	159
T22A	2164	2115	49	2117	47	2118	46	2121	43	2121	43
T22B	1883	1746	137	1740	143	1736	147	1731	152	1729	154
T23A	1830	1766	64	1768	62	1766	64	1772	58	1770	60
T23B	2029	1848	181	1847	182	1844	185	1843	186	1843	186
T24A	2227	2484	-257	2480	-253	2478	-251	2484	-257	2488	-261
T24B	1767	1760	7	1765	2	1763	4	1764	3	1764	3
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section
Date installed 09/04/84 Tunnel No. 2

Chainage 984 a
Sheet 9

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	19.04	19.00	20.04	1.30	23.04	22.45	24.04	6.00	24.04	23.04
Tunnel ch.	989.70	1112.00		1117.30		1128.50		1133.30		1145.00	
T13A	1698	1691	7	1691	7	1690	8	1690	8	1690	8
T13B	1964	1936	28	1940	24	1948	16	1944	20	1937	27
T14A	1975	2020	-45	2021	-46	2018	-43	2018	-43	2019	-44
T14B	1955	1834	121	1837	118	1840	115	1836	119	1834	121
T15A	1925	1909	16	1912	13	1913	12	1912	13	1912	13
T15B	1943	1874	69	1875	68	1877	66	1874	69	1871	72
T16A	2321	2349	-28	2349	-28	2348	-27	2349	-28	2352	-31
T16B	2151	2122	29	2116	35	2117	34	2122	29	2116	35
T17A	2182	2120	62	2120	62	2121	61	2122	60	2121	61
T17B	2026	1916	110	1917	109	1915	111	1912	114	1914	112
T18A	2121	2109	12	2112	9	2112	9	2112	9	2110	11
T18B	1819	1698	121	1698	121	1698	121	1700	119	1698	121
T19A	2029	1848	181	1848	181	1842	187	1845	184	1854	175
T19B	1905	-	-	-	-	-	-	-	-	-	-
T20A	1825	1821	4	1821	4	1806	19	1803	22	1801	24
T20B	1950	1783	167	1785	165	1788	162	1787	163	1783	167
T21A	2151	2113	38	2213	-62	2232	-81	2232	-81	2234	-83
T21B	1848	1693	155	1695	153	1723	125	1725	123	1724	124
T22A	2164	2120	44	2120	44	2115	49	2114	50	2125	39
T22B	1883	1721	162	1719	164	1705	178	1703	180	1699	184
T23A	1830	1767	63	1766	64	1783	47	1782	48	1778	52
T23B	2029	1840	189	1840	189	1851	178	1847	182	1840	189
T24A	2227	2500	-273	2504	-277	2527	-300	2527	-300	2523	-296
T24B	1767	1765	2	1765	2	1750	17	1758	9	1761	6
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 10

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	25.04	3.00	26.04	1.00	26.04	10.00	4.05	10.00	7.06	11.00
Tunnel ch.	989.70	1149.50		1161.90		1169.15		1254.74		1522.35	
T13A	1698	1691	7	1691	7	1691	7	1692	6	1686	12
T13B	1964	1934	30	1933	31	1933	31	1928	36	2006	-42
T14A	1975	2018	-43	2017	-42	2017	-42	2014	-39	2039	-64
T14B	1955	1828	127	1829	126	1828	127	1820	135	1824	131
T15A	1925	1911	14	1911	14	1910	15	1911	14	1931	-6
T15B	1943	1871	72	1870	73	1871	72	1864	79	1890	53
T16A	2321	2352	-31	2350	-29	2345	-24	2345	-24	2351	-30
T16B	2151	2117	34	2118	33	2114	37	2115	36	2146	5
T17A	2182	2122	60	2122	60	2115	67	2117	65	2130	52
T17B	2026	1910	116	1910	116	1922	104	1906	120	1887	139
T18A	2121	2110	11	2111	10	2104	17	2121	0	2117	4
T18B	1819	1695	124	1695	124	1689	130	1684	135	1746	73
T19A	2029	1895	134	1883	146	1925	104	1931	98	1935	94
T19B	1905	-	-	-	-	-	-	-	-	-	-
T20A	1825	1801	24	1800	25	1799	26	1807	18	1790	35
T20B	1950	1781	169	1785	165	1787	163	1813	137	1928	22
T21A	2151	2235	-84	2233	-82	2247	-96	2185	-34	1793	358
T21B	1848	1723	125	1322	526	1734	114	1770	78	1874	-26
T22A	2164	2125	39	2125	39	2127	37	2125	39	2123	41
T22B	1883	1677	186	1699	184	1693	190	1692	191	1696	187
T23A	1830	1777	53	1779	51	1777	53	1782	48	1792	38
T23B	2029	1838	191	1836	193	1842	187	1843	186	1856	173
T24A	2227	2524	-297	2526	-299	2524	-297	2508	-281	2495	-268
T24B	1767	1761	6	1760	7	1760	7	1766	1	1753	14
						No load		No load		No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks - Lower Section
Date installed 09/04/84 Tunnel No. 2

Chainage 984 m
Sheet 11

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	30.07	10.00	28.11	10.00	20.02	12.00				
Tunnel ch.	989.70	1816.45		3292.08		3579.78	1985				
T13A	1698	1676	22	1697	1	1698	0				
T13B	1964	1953	11	2037	-73	2074	-110				
T14A	1975	2012	-37	2005	-30	2000	-25				
T14B	1955	1787	168	1828	127	1848	107				
T15A	1925	1934	-9	1918	7	1914	11				
T15B	1943	1856	87	1867	76	1876	67				
T16A	2321	2314	7	2399	-78	2387	-66				
T16B	2151	2140	11	2635	-484	2866	-715				
T17A	2182	2152	30	2186	-4	2192	-10				
T17B	2026	1861	165	2029	-3	2050	-24				
T18A	2121	2336	-215	2336	-215	2320	-199				
T18B	1819	1854	-35	1575	244	1498	321				
T19A	2029	1924	105	1944	85	1950	79				
T19B	1905	-	-	-	-	-	-				
T20A	1825	1702	123	1661	164	1661	164				
T20B	1950	2016	-66	-	1950	-	-				
T21A	2151	1880	271	2140	11	2399	-248				
T21B	1848	1990	-142	1818	30	1568	280				
T22A	2164	2106	58	2113	51	2120	44				
T22B	1883	1682	201	1688	195	1720	163				
T23A	1830	1971	-	-	1830	2007	-177				
T23B	2029	1798	231	1813	216	1848	181				
T24A	2227	2466	-239	2479	-252	2507	-280				
T24B	1767	1760	7	1754	13	1751	16				
Comments	Datum	No load		No load		No load					

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 m
Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	28.05	10.50	28.05	13.47	28.05	15.30	28.05	15.45	28.05	16.15
Tunnel ch.	1427.97	1427.97		1427.97		1427.97		1428.17		1428.17	
T 1A	1766	1766	0	1763	3	1506	260	1484	282	1449	317
T 1B	1937	1937	0	1939	-2	1781	156	1768	169	1753	184
T 4A	1986	1986	0	1986	0	1666	320	1647	339	1611	375
T 4B	1700	1700	0	1701	-1	1381	319	1371	329	1352	348
T 5A	2044	2044	0	2042	2	1911	133	1874	170	1842	202
T 5B	2114	2114	0	2112	2	1804	310	1769	345	1736	378
T 8A	1876	1876	0	1876	0	1485	391	1396	480	1332	544
T 8B	1642	1642	0	1648	-6	1331	311	1319	323	1296	346
T 9A	1970	1970	0	1970	0	1549	421	1465	505	1453	517
T 9B	2054	2054	0	2054	0	1814	240	1780	274	1771	283
T12A	2089	2089	0	2092	-3	1844	245	1845	244	1784	305
T12B	1924	1924	0	1924	0	1032	892	890	1034	752	1172
T13A	2168	2168	0	2167	1	1701	467	1612	556	1541	627
T13B	2001	2001	0	2002	-1	1136	865	1064	937	946	1055
T16A	2026	2026	0	2027	-1	1238	788	1257	769	1089	937
T16B	2101	2101	0	2099	2	1488	613	1504	597	1375	726
T17A	1852	1852	0	1852	0	1186	666	1128	724	971	881
T17B	1940	1940	0	1941	-1	1035	905	1010	930	851	1089
T20A	2238	2238	0	2239	0	1499	739	1572	666	1312	926
T20B	2222	2222	0	2225	-3	1577	645	1513	709	1397	825
T21A	1750	1750	0	1750	0	1035	715	1040	710	888	862
T21B	1698	1698	0	1697	1	931	767	986	712	778	920
T24A	1978	1978	0	1978	0	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum	No load		No load		Mining 2000 psi		Under load head not turning			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 m
Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	28.05	16.25	28.05	16.50	28.05	17.24	28.05	17.50	28.05	18.00
Tunnel ch.	1427.97	1428.50		1429.10		1429.20		1429.30		1429.30	
T 1A	1766	1485	281	1503	263	1326	440	1401	365	1730	36
T 1B	1937	1739	198	1736	201	1710	227	1744	193	1975	-38
T 4A	1986	1593	393	1594	392	1497	489	1577	409	1941	45
T 4B	1700	1335	365	1360	340	1209	491	1276	424	1700	0
T 5A	2044	1738	306	1712	332	1545	499	1597	447	2057	-13
T 5B	2114	1720	394	1747	367	1627	487	1620	494	2092	22
T 8A	1876	1140	736	1045	831	889	987	906	970	1836	40
T 8B	1642	1152	490	1060	582	867	775	912	730	1646	-4
T 9A	1970	1269	701	997	973	981	989	902	1068	1862	108
T 9B	2054	1683	371	1685	369	1677	377	1712	342	2016	38
T12A	2089	1672	417	1638	451	1634	455	1690	399	2048	41
T12B	1924	580	1344	610	1314	542	1382	720	1204	1834	90
T13A	2168	1336	832	1295	873	1441	727	1392	776	2055	113
T13B	2001	924	1077	730	1271	735	1266	854	1147	1842	159
T16A	2026	1088	938	963	1063	1091	935	1123	903	-	-
T16B	2101	1411	690	1425	676	1421	680	1513	588	2073	28
T17A	1852	978	874	1001	851	1058	794	1175	677	1833	19
T17B	1940	908	1032	827	1113	901	1039	984	956	1908	32
T20A	2238	1391	847	1359	879	1426	812	1312	926	2292	-54
T20B	2222	1397	825	1428	794	1366	856	1450	772	2195	27
T21A	1750	820	930	873	877	895	855	1018	732	1688	62
T21B	1698	777	921	718	980	749	949	877	821	1585	113
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum			Mining at 2000 psi						No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	28.05	19.03	28.05	20.07	28.05	20.55	28.05	22.00	28.05	22.40
Tunnel ch.	1427.97	1430.50		1430.97		1431.50		1432.47		1433.20	
T 1A	1766	1493	273	1802	-36	1524	242	1834	-68	1503	263
T 1B	1937	1726	211	1889	48	1749	188	1827	110	1502	435
T 4A	1986	1788	198	1979	7	1820	166	1980	6	1540	446
T 4B	1700	1222	478	1656	44	1334	366	1628	72	1139	561
T 5A	2044	1584	460	2027	17	1723	321	2103	-59	1682	362
T 5B	2114	1817	297	2059	55	1856	258	1972	142	1375	739
T 8A	1876	1443	433	1843	33	1573	303	1848	28	1730	146
T 8B	1642	1356	286	1630	12	1152	490	1624	18	726	916
T 9A	1970	1318	652	1807	163	1312	658	1873	97	1355	615
T 9B	2054	1755	299	2089	-35	1817	237	1991	63	1485	569
T12A	2089	1816	273	2026	63	1923	166	2083	6	1958	131
T12B	1924	1060	864	1848	76	1059	865	1658	266	657	1267
T13A	2168	1689	479	1997	171	1738	430	2074	94	1896	272
T13B	2001	610	1391	1800	201	725	1276	1405	596	-	-
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1354	747	2048	53	1350	751	1896	205	922	1179
T17A	1852	1294	558	1808	44	1359	493	1815	37	1396	456
T17B	1940	992	948	1931	9	1045	895	1877	63	800	1140
T20A	2238	1928	310	2302	-64	1898	340	2349	-111	2085	153
T20B	2222	1568	654	2152	70	1255	967	1972	250	1268	954
T21A	1750	1463	287	1686	64	1086	664	1555	195	1318	432
T21B	1698	1216	482	1565	133	763	935	1437	261	1194	504
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
				No load				No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 m
Sheet 4

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	29.05	1.00	29.05	1.45	29.05	4.40	29.05	6.00	29.05	6.15
Tunnel ch.	1427.97	1433.30		1433.60		1434.10		1435.47		1435.60	
T 1A	1766	1403	363	1575	191	1063	703	1815	-49	1465	301
T 1B	1937	1486	451	1604	333	1352	585	1810	127	1577	360
T 4A	1986	1540	446	1737	249	1444	542	1925	61	1611	375
T 4B	1700	1202	498	1389	311	1096	604	1631	69	1344	356
T 5A	2044	1724	320	1932	112	1695	349	2062	-18	1755	289
T 5B	2114	1350	764	1689	425	1275	839	1920	194	1420	694
T 8A	1876	1710	166	1852	24	1736	140	1869	7	1723	153
T 8B	1642	636	1006	973	669	718	924	1561	81	715	927
T 9A	1970	1561	409	1694	276	1486	484	1808	162	1586	384
T 9B	2054	1700	354	1844	210	1605	449	1930	124	1742	312
T12A	2089	1941	148	2038	51	1980	109	2085	4	1930	159
T12B	1924	737	1187	1076	848	853	1071	1591	333	773	1151
T13A	2168	2075	93	2065	103	2111	57	2050	118	2087	81
T13B	2001	1461	540	1496	505	1170	831	1563	438	1400	601
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1094	1007	1408	693	1124	977	1926	175	1106	995
T17A	1852	1644	208	1747	105	1642	210	1806	46	1630	222
T17B	1940	1090	850	1385	555	1148	792	1713	227	1192	748
T20A	2238	1863	375	2148	90	1878	360	2354	-116	1819	419
T20B	2222	1051	1171	1416	806	1159	1063	1914	308	1079	1143
T21A	1750	992	758	1291	459	1130	620	1615	135	1071	679
T21B	1698	665	1033	1097	601	830	868	1058	640	832	866
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum			No load				No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	29.05	7.30	29.05	16.30	29.05	17.15	29.05	17.30	29.05	18.10
Tunnel ch.	1427.97	1437.17		1439.30		1439.97		1440.00		1441.47	
T 1A	1766	1825	-59	1372	394	1753	13	1379	387	1734	32
T 1B	1937	1812	125	1718	219	1840	97	1712	225	1836	101
T 4A	1986	1925	61	1707	279	1866	120	1717	269	1845	141
T 4B	1700	1634	66	1368	332	1687	13	1376	324	1684	16
T 5A	2044	2060	-16	1782	262	2067	-23	1826	218	2054	-10
T 5B	2114	1913	201	1403	711	1920	194	1478	636	1914	200
T 8A	1876	1871	5	1741	135	1871	5	1779	97	1875	1
T 8B	1642	1558	84	765	877	1582	60	883	759	1560	82
T 9A	1970	1798	172	1334	636	1808	162	1520	450	1794	176
T 9B	2054	1920	134	1442	612	1874	180	1623	431	1855	199
T12A	2089	2077	12	1991	98	2075	14	2004	85	2073	16
T12B	1924	1563	361	954	970	1506	418	1259	665	1518	406
T13A	2168	2054	114	2009	159	2103	65	2093	75	2108	60
T13B	2001	1553	448	604	1397	1367	634	887	1114	1344	657
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1901	200	1253	848	1889	212	1251	850	1880	221
T17A	1852	1800	52	1540	312	1806	46	1552	300	1816	36
T17B	1940	1666	274	972	968	1515	425	963	977	1527	413
T20A	2238	2348	-110	2015	223	2277	-39	1893	345	2305	-67
T20B	2222	1896	326	1301	921	1649	573	1167	1055	1795	427
T21A	1750	1614	136	1194	556	1364	386	1047	703	1588	162
T21B	1698	1496	202	925	773	1105	593	711	987	1457	241
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum	No load				No load				No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 m
Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	29.05	18.45	29.05	19.30	29.05	19.55	29.05	21.00	30.05	2.05
Tunnel ch.	1427.97	1442.50		1442.97		1443.50		1444.00		1448.97	
T 1A	1766	1396	370	1710	56	1377	389	1687	79	1544	222
T 1B	1937	1714	223	1831	106	1704	233	1826	111	1757	180
T 4A	1986	1712	274	1842	144	1709	277	1828	158	1733	253
T 4B	1700	1393	307	1641	59	1393	307	1645	55	1568	132
T 5A	2044	1792	252	2037	7	1823	221	2028	16	1900	144
T 5B	2114	1454	660	1893	221	1528	586	1888	226	1711	403
T 8A	1876	1773	103	1881	-5	1807	69	1878	-2	1771	105
T 8B	1642	925	717	1542	100	1026	616	1545	97	1195	447
T 9A	1970	1379	591	1773	197	1346	624	1764	206	1605	365
T 9B	2054	1473	581	1832	222	1450	604	1821	233	1692	362
T12A	2089	2050	39	2061	28	2063	26	2052	37	2029	60
T12B	1924	1272	652	1508	416	1461	463	1474	450	1383	541
T13A	2168	2023	145	2109	59	2024	144	2106	62	2075	93
T13B	2001	624	1377	1255	746	642	1359	1221	780	1081	920
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1346	755	1849	252	1679	422	1703	398	1783	318
T17A	1852	1572	280	1764	88	1563	289	1776	76	1672	180
T17B	1940	986	954	1398	542	1008	932	1381	559	1241	699
T20A	2238	1943	295	2290	-52	2058	180	2284	-46	2210	28
T20B	2222	1250	972	1751	471	1612	610	1731	491	1614	608
T21A	1750	1115	635	1573	177	1058	692	1571	179	1481	269
T21B	1698	767	931	1433	265	694	1004	1418	280	1284	414
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum			No load				No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	30.05	5.45	30.05	21.29	30.05	23.17	31.05	2.30	31.05	5.50
Tunnel ch.	1427.97	1452.70		1461.50		1464.50		1468.00		1471.50	
T 1A	1766	1553	213	1550	216	1550	216	1531	235	1521	245
T 1B	1937	1756	181	1765	172	1765	172	1763	174	1769	168
T 4A	1986	1753	233	1790	196	1792	194	1803	183	1848	138
T 4B	1700	1598	102	1562	138	1564	136	1558	142	1483	217
T 5A	2044	1931	113	1920	124	1918	126	1921	123	1917	127
T 5B	2114	1768	346	1749	365	1747	367	1762	352	1758	356
T 8A	1876	1830	46	1803	73	1805	71	1784	92	1807	69
T 8B	1642	1310	332	1387	255	1398	244	1420	222	1376	266
T 9A	1970	1613	357	1589	381	1584	386	1585	385	1572	398
T 9B	2054	1693	361	1659	395	1656	398	1658	396	1646	408
T12A	2089	2014	75	2004	85	2003	86	1990	99	1989	100
T12B	1924	1403	521	1433	491	1434	490	1445	479	1437	487
T13A	2168	2064	104	2043	125	2035	133	2029	139	2030	138
T13B	2001	1033	968	995	1006	999	1002	1010	991	979	1022
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1494	607	1616	485	1613	488	1614	487	1633	468
T17A	1852	1666	186	1618	234	1622	230	1596	256	1594	258
T17B	1940	1236	704	1170	770	1195	745	1199	741	1177	763
T20A	2238	2005	233	2022	216	2004	234	1990	258	1990	248
T20B	2222	1371	851	1454	768	1443	779	1433	789	1474	748
T21A	1750	1248	502	1321	429	1310	440	1304	446	1296	454
T21B	1698	932	766	1001	697	996	702	985	713	976	722
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 s
Sheet 8

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	31.05	22.47	1.06	2.00	1.06	6.00	2.06	2.30	2.06	5.45
Tunnel ch.	1427.97	1482.50		1485.50		1490.00		1505.50		1508.00	
T 1A	1766	1530	236	1530	236	1527	239	1516	250	1516	250
T 1B	1937	1743	194	1734	203	1736	201	1739	198	1739	198
T 4A	1986	1838	148	1823	163	1825	161	1825	161	1826	160
T 4B	1700	1477	223	1470	230	1475	225	1472	228	1474	226
T 5A	2044	1907	137	1903	141	1903	141	1899	145	1899	145
T 5B	2114	1741	373	1734	380	1734	380	1729	385	1729	385
T 8A	1876	1784	92	1776	100	1773	103	1771	105	1774	102
T 8B	1642	1385	257	1393	249	1397	245	1401	241	1402	240
T 9A	1970	1578	392	1566	404	1565	405	1562	408	1561	409
T 9B	2054	1633	421	1628	426	1628	426	1624	430	1624	430
T12A	2089	1976	113	1973	116	1972	117	1967	122	1967	122
T12B	1924	1429	495	1433	491	1431	493	1433	491	1434	490
T13A	2168	2009	159	1998	170	1999	169	1998	170	1998	170
T13B	2001	991	1010	993	1008	989	1012	988	1013	989	1012
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1655	446	1653	448	1656	445	1672	429	1677	424
T17A	1852	1578	274	1572	280	1577	275	1571	281	1571	281
T17B	1940	1170	770	1179	761	1177	763	1176	764	1179	761
T20A	2238	1974	264	1972	266	1987	251	1973	265	1986	252
T20B	2222	1485	737	1494	728	1478	744	1487	735	1492	730
T21A	1750	1278	472	1272	478	1274	476	1272	478	1277	473
T21B	1698	970	728	983	715	983	715	972	726	985	713
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Dankin-Horien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 m
Sheet 9

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	20.05	4.06	19.00	4.06	22.30	6.06	6.00	6.06	17.00	7.06	10.00
Tunnel ch.	1427.97	1513.90		1517.00		1522.35		1522.35		1522.35	
T 1A	1766	1523	243	1522	244	1514	252	1512	254	1517	249
T 1B	1937	1734	203	1731	206	1739	198	1726	211	1723	214
T 4A	1986	1840	146	1841	145	1901	85	1904	82	1903	83
T 4B	1700	1471	229	1468	232	1428	272	1419	281	1423	277
T 5A	2044	1905	139	1903	141	1908	136	1902	142	1903	141
T 5B	2114	1742	372	1739	375	1746	368	1735	379	1739	375
T 8A	1876	1817	59	1817	59	1790	86	1783	93	1785	91
T 8B	1642	1398	244	1397	245	1433	209	1438	204	1437	205
T 9A	1970	1780	190	1578	392	1580	390	1568	402	1574	396
T 9B	2054	1632	422	1631	423	1632	422	1626	428	1628	426
T12A	2089	1973	116	1973	116	1988	101	1986	103	1987	102
T12B	1924	1467	457	1465	459	1465	459	1451	473	1454	470
T13A	2168	2007	161	2004	164	2003	165	1998	170	2000	168
T13B	2001	1025	976	1022	979	1028	973	1012	989	1017	984
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1708	393	1708	393	1715	386	1704	397	1707	394
T17A	1852	1583	269	1582	270	1583	269	-	-	-	-
T17B	1940	1208	732	1205	735	1212	728	1201	739	1200	740
T20A	2238	1972	266	1971	267	1972	266	1972	266	1973	265
T20B	2222	1540	682	1539	683	1546	676	1541	681	1536	686
T21A	1750	1276	474	1276	474	1277	473	1275	475	1274	476
T21B	1698	991	707	991	707	996	702	996	702	996	702
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
						No load		No load		No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 10

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	12.06	9.45	15.06	2.15	15.06	5.30	16.06	1.45	28.06	21.00
Tunnel ch.	1427.97	1523.85		1569.00		1572.50		1585.70		1627.78	
T 1A	1766	1504	262	1500	266	1500	266	1500	266	1493	273
T 1B	1937	1704	233	1699	238	1700	237	1705	232	1702	235
T 4A	1986	1950	36	1974	12	1976	10	1983	3	2034	-48
T 4B	1700	1364	336	1332	368	1330	370	1328	372	1268	432
T 5A	2044	1887	157	1883	161	1883	161	1888	156	1888	156
T 5B	2114	1714	400	1709	405	1709	405	1715	399	1715	399
T 8A	1876	1741	135	1722	154	1720	156	1718	158	1704	172
T 8B	1642	1465	177	1478	164	1478	164	1483	159	1482	160
T 9A	1970	1556	414	1553	417	1554	416	1560	410	1553	417
T 9B	2054	1618	436	1615	439	1615	439	1620	434	1616	438
T12A	2089	1999	90	2002	87	2002	87	2002	87	2010	79
T12B	1924	1417	507	1412	512	1411	513	1418	506	1388	536
T13A	2168	1994	174	1992	176	1992	176	1995	173	1989	179
T13B	2001	995	1006	-	-	-	-	-	-	997	1004
T16A	2026	-	-	-	-	-	-	-	-	-	-
T16B	2101	1686	415	1688	413	1690	411	1695	406	1687	414
T17A	1852	1563	289	1558	294	1558	294	1562	290	1549	303
T17B	1940	1174	766	1168	772	1168	772	1175	765	1176	764
T20A	2238	1966	272	1964	274	1964	274	1966	272	1923	315
T20B	2222	1523	699	1523	699	1523	699	1526	696	1520	702
T21A	1750	1264	486	-	-	-	-	-	-	1254	496
T21B	1698	987	711	-	-	-	-	-	-	973	725
T24A	1978	-	-	-	-	-	-	-	-	-	-
T24B	-	-	-	-	-	-	-	-	-	-	-
										No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 m
Sheet 11

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	30.07	10.00	28.11	10.00	20.02	12.00				
Tunnel ch.	1427.97	1817.45		3292.08		3579.78	1985				
T 1A	1766	1465	301	1461	305	1470	296				
T 1B	1937	1677	260	1609	328	1613	324				
T 4A	1986	1993	-7	1950	36	1971	15				
T 4B	1700	1247	453	1228	472	1228	472				
T 5A	2044	1866	178	1905	139	1914	130				
T 5B	2114	1703	411	1726	388	1742	372				
T 8A	1876	1671	205	1753	123	1730	146				
T 8B	1642	1487	155	1504	138	1513	129				
T 9A	1970	1537	433	1547	423	1578	392				
T 9B	2054	1613	441	1620	434	1624	430				
T12A	2089	2005	84	2005	84	2011	78				
T12B	1924	1343	581	1444	480	1470	454				
T13A	2168	1978	190	2006	162	2015	153				
T13B	2001	985	1016	1032	969	1058	943				
T16A	2026	-	-	-	-	-	-				
T16B	2101	1566	535	2020	81	2208	-107				
T17A	1852	1533	319	1547	305	1558	294				
T17B	1940	1179	761	1269	671	1331	609				
T20A	2238	2030	208	2105	133	2123	115				
T20B	2222	1482	740	1523	699	1545	677				
T21A	1750	1211	539	1236	514	1248	502				
T21B	1698	964	734	981	717	-	1698				
T24A	1978	-	-	-	-	-	-				
T24B	-	-	-	-	-	-	-				
		No load		No load		No load					
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	1.08	12.45	1.08	14.15	1.08	15.45	1.08	17.00	1.08	17.30
Tunnel ch.	1835.90	1835.90		1836.00		1837.40		1838.00		1838.90	
T 2A	1924	1924	0	1589	335	1926	-2	1837	87	1923	1
T 2B	1800	1800	0	1498	302	1814	-14	1485	315	1819	-19
T 6A	2097	-	-	-	-	-	-	1925	172	2097	0
T 6B	1973	1973	0	1060	913	2044	-71	-	-	1977	-4
T 7A	2009	2009	0	968	1041	1933	76	1401	608	1949	60
T 7B	2086	2086	0	1540	546	2101	-15	1769	317	2080	6
T12A	1664	1664	0	1432	232	1606	58	1565	99	1658	6
T12B	1998	-	-	-	-	1998	0	-	-	1962	36
T13A	1949	1949	0	1346	603	1920	29	1578	371	1814	135
T13B	1852	1852	0	1292	560	1883	-31	1493	359	1931	-79
T18A	1871	-	-	1720	151	1871	0	1780	91	1867	4
T18B	1434	-	-	571	863	1434	0	-	-	1468	-34
T19A	1836	1836	0	752	1084	1798	38	1375	461	1693	143
T19B	2068	2068	0	1290	778	2041	27	1139	929	2137	-69
T24A	2125	2125	0	1486	639	2123	2	1752	373	2084	41
T24B	2331	2331	0	1586	745	2341	-10	1861	470	2383	-52
Comments	Datum	No load				No load				No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/94 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	1.08	17.44	1.08	18.48	1.08	19.05	1.08	19.49	1.08	20.40
Tunnel ch.	1835.90	1839.00		1840.50		1841.00		1841.10		1841.50	
T 2A	1924	1748	176	1665	259	1680	244	1720	204	1645	279
T 2B	1800	1283	517	1425	375	1462	338	1584	216	1459	341
T 6A	2097	-	-	1606	491	-	-	-	-	1993	104
T 6B	1973	1821	152	1772	201	-	-	-	-	1869	104
T 7A	2009	1896	113	1941	68	1897	112	1920	89	1735	274
T 7B	2086	1958	128	2012	74	1949	137	1969	117	1701	385
T12A	1664	1481	183	1674	-10	1550	114	1623	41	1509	155
T12B	1998	-	-	-	-	-	-	-	-	-	-
T13A	1949	1432	517	1595	354	1577	372	1758	191	1571	378
T13B	1852	1180	672	1231	621	1088	764	1396	456	1036	816
T18A	1871	1803	68	1826	45	1833	38	1861	10	1825	46
T18B	1434	940	494	928	506	925	509	1166	268	892	542
T19A	1836	1261	575	1237	599	1358	478	1577	259	1316	520
T19B	2068	730	1338	624	1444	726	1342	1122	946	666	1402
T24A	2125	1528	597	1484	641	1614	511	1864	261	1572	553
T24B	2331	1512	819	1228	1103	1415	916	1721	610	1372	959
Comments	Datum							No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	1.08	20.50	1.08	21.20	1.08	21.56	1.08	22.35	1.08	23.15
Tunnel ch.	1835.90	1841.90		1842.20		1843.40		1843.70		1844.90	
T 2A	1924	1904	20	1584	340	1866	58	1605	319	1856	68
T 2B	1800	1785	15	1381	419	1739	61	1451	349	1720	80
T 6A	2097	-	-	1932	165	2099	-2	-	-	2051	46
T 6B	1973	1933	40	1526	447	-	-	1775	198	-	-
T 7A	2009	1965	44	1746	263	1965	44	1951	58	1966	43
T 7B	2086	2056	30	1715	371	2044	42	2001	85	2035	51
T12A	1664	1673	-9	1595	69	1669	-5	1668	-4	1659	5
T12B	1998	-	-	-	-	-	-	-	-	-	-
T13A	1949	1923	26	1753	196	1925	24	1696	253	1934	15
T13B	1852	1885	-33	1383	469	1881	-29	1223	629	1854	-2
T18A	1871	1877	-6	1854	17	1874	-3	1832	39	1875	-4
T18B	1434	-	-	1088	346	1438	-4	974	460	-	-
T19A	1836	1728	108	1451	385	1730	106	1288	548	1722	114
T19B	2068	2007	61	941	1127	1964	104	699	1369	1933	135
T24A	2125	2085	40	1734	391	2075	50	1609	516	2062	63
T24B	2331	2262	69	1554	777	2132	199	1357	974	2071	260
Comments	Datum	No load				No load				No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 01/08/84 Tunnel No. 2 Chainage 1831 m
Sheet 4

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	1.08	23.30	2.08	.30	2.08	1.10	2.08	1.30	2.08	2.30
Tunnel ch.	1835.90	1845.00		1845.40		1846.40		1846.50		1847.90	
T 2A	1924	1609	315	1640	284	1846	78	1790	134	1848	76
T 2B	1800	1451	349	1472	328	1697	103	1638	162	1695	105
T 6A	2097	-	-	-	-	1466	631	-	-	-	-
T 6B	1973	1836	137	1768	205	1906	67	1763	210	1903	70
T 7A	2009	1955	54	1916	93	1964	45	1915	94	1960	49
T 7B	2086	2008	78	1952	134	2029	57	1937	149	2025	61
T12A	1664	1666	-2	1506	158	1653	11	1603	61	1642	22
T12B	1998	-	-	-	-	-	-	-	-	-	-
T13A	1949	1677	272	1579	370	1933	16	1817	132	1936	13
T13B	1852	1211	641	1582	270	1844	8	1422	430	1816	36
T18A	1871	1827	44	1836	35	1876	-5	1778	93	1874	-3
T18B	1434	928	506	-	-	-	-	595	839	-	-
T19A	1836	1296	540	1336	500	1719	117	1222	614	1731	105
T19B	2068	1297	771	777	1291	1916	152	594	1474	1865	203
T24A	2125	1598	527	1642	483	2060	65	1803	322	2057	68
T24B	2331	1343	988	1394	937	2029	302	1618	713	2044	287
Comments	Datum					No load				No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Dankin-Marien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 a
Date installed 01/08/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	2.08	2.50	2.08	3.40	2.08	4.00	2.08	5.40	2.08	6.00
Tunnel ch.	1835.90	1848.00		1849.40		1849.80		1850.90		1851.00	
T 2A	1924	1824	100	1850	74	1846	78	1840	84	1802	122
T 2B	1800	1691	109	1693	107	1696	104	1703	97	1650	150
T 6A	2097	-	-	-	-	-	-	-	-	-	-
T 6B	1973	1851	122	1900	73	1894	79	1891	82	1783	190
T 7A	2009	1933	76	1957	52	1959	50	1954	55	1915	94
T 7B	2086	1989	97	2019	67	2027	59	2021	65	1942	144
T12A	1664	1406	258	1626	38	1487	177	1444	220	1513	151
T12B	1998	-	-	-	-	-	-	-	-	-	-
T13A	1949	1597	352	1934	15	1660	289	1695	254	1750	199
T13B	1852	1044	808	1798	54	1133	719	1207	645	1302	550
T18A	1871	1730	141	1875	-4	1757	114	1787	84	1790	81
T18B	1434	421	1013	-	-	463	971	615	819	619	815
T19A	1836	1186	650	1727	109	1223	613	1312	524	1378	458
T19B	2068	519	1549	1837	231	549	1519	689	1379	789	1279
T24A	2125	1787	338	2072	53	1790	335	1786	339	1876	249
T24B	2331	1596	735	2037	294	1596	735	1567	764	1731	600
Comments	Datum			No load				No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	2.08	7.40	2.08	19.45	2.08	22.30	3.08	2.15	3.08	2.45
Tunnel ch.	1835.90	1853.50		1855.50		1858.50		1863.50		1864.40	
T 2A	1924	1799	125	-	-	-	-	-	-	-	-
T 2B	1800	1648	152	1611	189	1603	197	1609	191	1609	191
T 6A	2097	-	-	1906	191	1902	195	-	-	-	-
T 6B	1973	1775	198	1783	190	1620	353	1842	131	1844	129
T 7A	2009	1913	96	1943	66	1860	149	1942	67	1940	69
T 7B	2086	1933	153	1986	100	1831	255	1988	98	1988	98
T12A	1664	1510	154	1516	148	1474	190	1500	164	1501	163
T12B	1998	-	-	1731	267	1701	297	1731	267	1732	266
T13A	1949	1748	201	1888	61	1908	41	1882	67	1882	67
T13B	1852	1299	553	1664	188	1756	96	1653	199	1657	195
T18A	1871	1793	78	1796	75	1834	37	1845	26	1868	3
T18B	1434	639	795	558	876	765	669	848	586	1038	396
T19A	1836	1379	457	1404	432	1567	269	1547	289	1637	199
T19B	2068	792	1276	749	1319	1100	968	1086	982	1463	605
T24A	2125	1875	250	1914	211	1920	205	1908	217	1907	218
T24B	2331	1724	607	1755	576	1756	575	1742	589	1739	592
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 01/08/84 Tunnel No. 2 Chainage 1831 a
Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	3.08	6.00	3.08	6.45	3.08	18.00	3.08	21.00	6.08	15.04
Tunnel ch.	1835.90	1867.80		1868.90		1874.00		1877.00		1889.10	
T 2A	1924	-	-	-	-	1748	176	1753	171	1720	204
T 2B	1800	1618	182	1609	191	1593	207	1591	209	1543	257
T 6A	2097	-	-	-	-	-	-	-	-	1984	113
T 6B	1973	1858	115	1852	121	1845	128	1843	130	1825	148
T 7A	2009	1943	66	1944	65	1942	67	1943	66	1931	78
T 7B	2086	1995	91	1997	89	1993	93	1991	95	1972	114
T12A	1664	1514	150	1516	148	1524	140	1527	137	1535	129
T12B	1998	1745	253	1745	253	1753	245	1756	242	1771	227
T13A	1949	1875	74	1874	75	1869	80	1874	75	1851	98
T13B	1852	1667	185	1658	194	1658	194	1668	184	1635	217
T18A	1871	1854	17	1866	5	1857	14	1861	10	1874	-3
T18B	1434	895	539	983	451	888	546	906	528	938	496
T19A	1836	1552	284	1615	221	1591	245	1565	271	1516	320
T19B	2068	1157	911	1407	661	1310	758	1232	836	1318	750
T24A	2125	1929	196	1928	197	1957	168	1952	173	1966	159
T24B	2331	1747	584	1738	593	1751	580	1741	590	1772	559
Comments	Datum									No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 8

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	6.08	15.30	7.08	1.20	7.08	1.45	7.08	5.25	7.08	6.04
Tunnel ch.	1835.90	1889.74		1896.00		1896.20		1899.00		1899.50	
T 2A	1924	1721	203	1718	206	1717	207	1717	207	1717	207
T 2B	1800	1543	257	1538	262	1537	263	1533	267	1533	267
T 6A	2097	1985	112	1984	113	1985	112	1985	112	1985	112
T 6B	1973	1824	149	1817	156	1817	156	1817	156	1816	157
T 7A	2009	1931	78	1930	79	1930	79	1928	81	1929	80
T 7B	2086	1972	114	1965	121	1965	121	1967	119	1966	120
T12A	1664	1535	129	1533	131	1533	131	1533	131	1533	131
T12B	1998	1771	227	1767	231	1768	230	1767	231	1767	231
T13A	1949	1851	98	1848	101	1848	101	1847	102	1847	102
T13B	1852	1636	216	1628	224	1628	224	1626	226	1626	226
T18A	1871	1874	-3	1871	0	1871	0	1872	-1	1873	-2
T18B	1434	937	497	937	497	937	497	942	492	942	492
T19A	1836	1516	320	1578	258	1578	258	1572	264	1570	266
T19B	2068	1319	749	1246	822	1245	823	1252	816	1253	815
T24A	2125	1966	159	1972	153	1972	153	1970	155	1971	154
T24B	2331	1773	558	1786	545	1786	545	1783	548	1783	548
								No load		No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 9

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	7.08	18.32	7.08	21.45	8.08	1.15	8.08	5.30	8.08	18.23
Tunnel ch.	1835.90	1906.50		1909.20		1913.20		1916.70		1921.80	
T 2A	1924	1715	209	1713	211	1713	211	1712	212	1709	215
T 2B	1800	1526	274	1526	274	1525	275	1526	274	1519	281
T 6A	2097	1985	112	1984	113	1985	112	1985	112	1984	113
T 6B	1973	1813	160	1813	160	1812	161	1813	160	1810	163
T 7A	2009	1927	82	1927	82	1927	82	1927	82	1926	83
T 7B	2086	1963	123	1963	123	1962	124	1962	124	1958	128
T12A	1664	1533	131	1533	131	1533	131	1533	131	1533	131
T12B	1998	1767	231	1768	230	1768	230	1768	230	1769	229
T13A	1949	1845	104	1844	105	1844	105	1844	105	1843	106
T13B	1852	1621	231	1620	232	1622	230	1623	229	1624	228
T18A	1871	1874	-3	1874	-3	1875	-4	1876	-5	1878	-7
T18B	1434	939	495	943	491	936	498	937	497	938	496
T19A	1836	1563	273	1561	275	1563	273	1559	277	1554	282
T19B	2068	1261	807	1265	803	1264	804	1269	799	1270	798
T24A	2125	1976	149	1981	144	1985	140	1985	140	1988	137
T24B	2331	1787	544	1787	544	1786	545	1785	546	1783	548
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 10

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	8.08	22.44	9.08	1.30	9.08	6.20	9.08	21.02	9.08	22.30
Tunnel ch.	1835.90	1924.30		1926.70		1930.70		1937.20		1938.50	
T 2A	1924	1708	216	1710	214	1710	214	1709	215	1706	218
T 2B	1800	1519	281	1518	282	1520	280	1520	280	1519	281
T 6A	2097	1985	112	1985	112	1985	112	1987	110	1988	109
T 6B	1973	1808	165	1809	164	1910	63	1811	162	1810	163
T 7A	2009	1927	82	1926	83	1929	80	1928	81	1928	81
T 7B	2086	1957	129	1957	129	1958	128	1957	129	1957	129
T12A	1664	1533	131	1534	130	1535	129	1536	128	1536	128
T12B	1998	1769	229	1771	227	1772	226	1774	224	1774	224
T13A	1949	1842	107	1844	105	1844	105	1844	105	1844	105
T13B	1852	1624	228	1625	227	1627	225	1630	222	1630	222
T18A	1971	1880	-9	1881	-10	1881	-10	1882	-11	1881	-10
T18B	1434	938	496	935	499	941	493	940	494	940	494
T19A	1836	1554	282	1553	283	1552	284	1550	286	1551	285
T19B	2068	1270	798	1269	799	1274	794	1280	788	1278	790
T24A	2125	1988	137	1988	137	1988	137	1988	137	1988	137
T24B	2331	1782	549	1783	548	1783	548	1783	548	1783	548

Comments: Datum

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 e
Date installed 01/08/84 — Tunnel No. 2 — Sheet 11

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	10.08	.45	10.08	5.20	10.08	21.09	10.08	23.31	11.08	1.00
Tunnel ch.	1835.90	1940.50		1945.20		1953.70		1955.50		1956.50	
T 2A	1924	1707	217	1706	218	1710	214	1708	216	1709	215
T 2B	1800	1519	281	1517	283	1512	288	1510	290	1508	292
T 6A	2097	1988	109	1988	109	1987	110	1988	109	1988	109
T 6B	1973	1810	163	1809	164	1807	166	1805	168	1803	170
T 7A	2009	1927	82	1927	82	1925	84	1925	84	1925	84
T 7B	2086	1957	129	1956	130	1954	132	1953	133	1952	134
T12A	1664	1536	128	1536	128	1535	129	1534	130	1534	130
T12B	1998	1775	223	1774	224	1773	225	1771	227	1771	227
T13A	1949	1843	106	1843	106	1841	108	1839	110	1840	109
T13B	1852	1630	222	1628	224	1628	224	1625	227	1624	228
T18A	1871	1881	-10	1883	-12	1884	-13	1885	-14	1885	-14
T18B	1434	941	493	938	496	944	490	939	495	939	495
T19A	1836	1550	286	1551	285	1550	286	1551	285	1548	288
T19B	2068	1279	789	1278	790	1280	788	1277	791	1275	793
T24A	2125	1986	139	1984	141	1981	144	1980	145	1984	141
T24B	2331	1784	547	1786	545	1786	545	1786	545	1790	541
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 12

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	11.08	6.00	13.08	10.45	14.08	11.00	15.08	10.45	16.08	13.30
Tunnel ch.	1835.90	1960.30		1960.67		1973.59		1991.07		1997.47	
T 2A	1924	1711	213	1707	217	1715	209	1715	209	1714	210
T 2B	1800	1503	297	1492	308	1489	311	1496	304	1497	303
T 6A	2097	1989	108	1991	106	1993	104	1997	100	1997	100
T 6B	1973	1801	172	1792	181	1790	183	1791	182	1790	183
T 7A	2009	1924	85	1920	89	1920	89	1917	92	1917	92
T 7B	2086	1951	135	1946	140	1946	140	1945	141	1944	142
T12A	1664	1531	133	1531	133	1533	131	1536	128	1535	129
T12B	1978	1769	229	1770	228	1772	226	1776	222	1776	222
T13A	1949	1838	111	1836	113	1836	113	1838	111	1839	110
T13B	1852	1620	232	1618	234	1620	232	1622	230	1621	231
T18A	1871	1885	-14	1890	-19	1891	-20	1894	-23	1894	-23
T18B	1434	939	495	936	498	937	497	938	496	940	494
T19A	1836	1547	289	1544	292	1543	293	1541	295	1541	295
T19B	2068	1275	793	1272	796	1270	798	1274	794	1273	795
T24A	2125	1982	143	1982	143	1976	149	1973	152	1972	153
T24B	2331	1790	541	1790	541	1790	541	1790	541	1789	542
Comments	Datum			No load		No load		No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Thrust Blocks
Date installed 01/08/84 Tunnel No. 2 Chainage 1831 e
Sheet 13

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	17.08	12.15	27.08	15.00	17.09	14.00	28.11	10.00	20.02	12.00
Tunnel ch.	1835.90	2003.37		2086.10		2351.50		3292.08		3579.78	1985
T 2A	1924	1708	216	1710	214	-	-	-	-	-	-
T 2B	1800	1491	309	1513	287	1525	275	1550	250	1566	234
T 6A	2097	2000	97	2003	94	2004	93	2023	74	2024	73
T 6B	1973	1788	185	1801	172	-	-	1823	150	1836	137
T 7A	2009	1914	95	1917	92	-	-	1911	98	1914	95
T 7B	2086	1943	143	1954	132	-	-	1953	133	1958	128
T12A	1664	1533	131	1545	119	1555	109	1564	100	1577	87
T12B	1998	1772	226	1787	211	1796	202	1800	198	1814	184
T13A	1949	1834	115	1839	110	1846	103	1852	97	1856	93
T13B	1852	1617	235	1642	210	1660	192	1675	177	1698	154
T18A	1871	1894	-23	1912	-41	1925	-54	1941	-70	1949	-78
T18B	1434	939	495	964	470	994	440	1022	412	-	-
T19A	1836	1540	296	1536	300	1534	302	1550	286	1585	251
T19B	2068	1270	798	1332	736	1434	634	1482	586	1531	537
T24A	2125	1972	153	1958	167	1955	170	1952	173	1955	170
T24B	2331	1788	543	1786	545	1787	544	1800	531	1816	515
Comments	Datum	No load		No load				No load		No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 1) ch. 984m

FIGURE C.23

Date November 1984

Project No. 831-6014

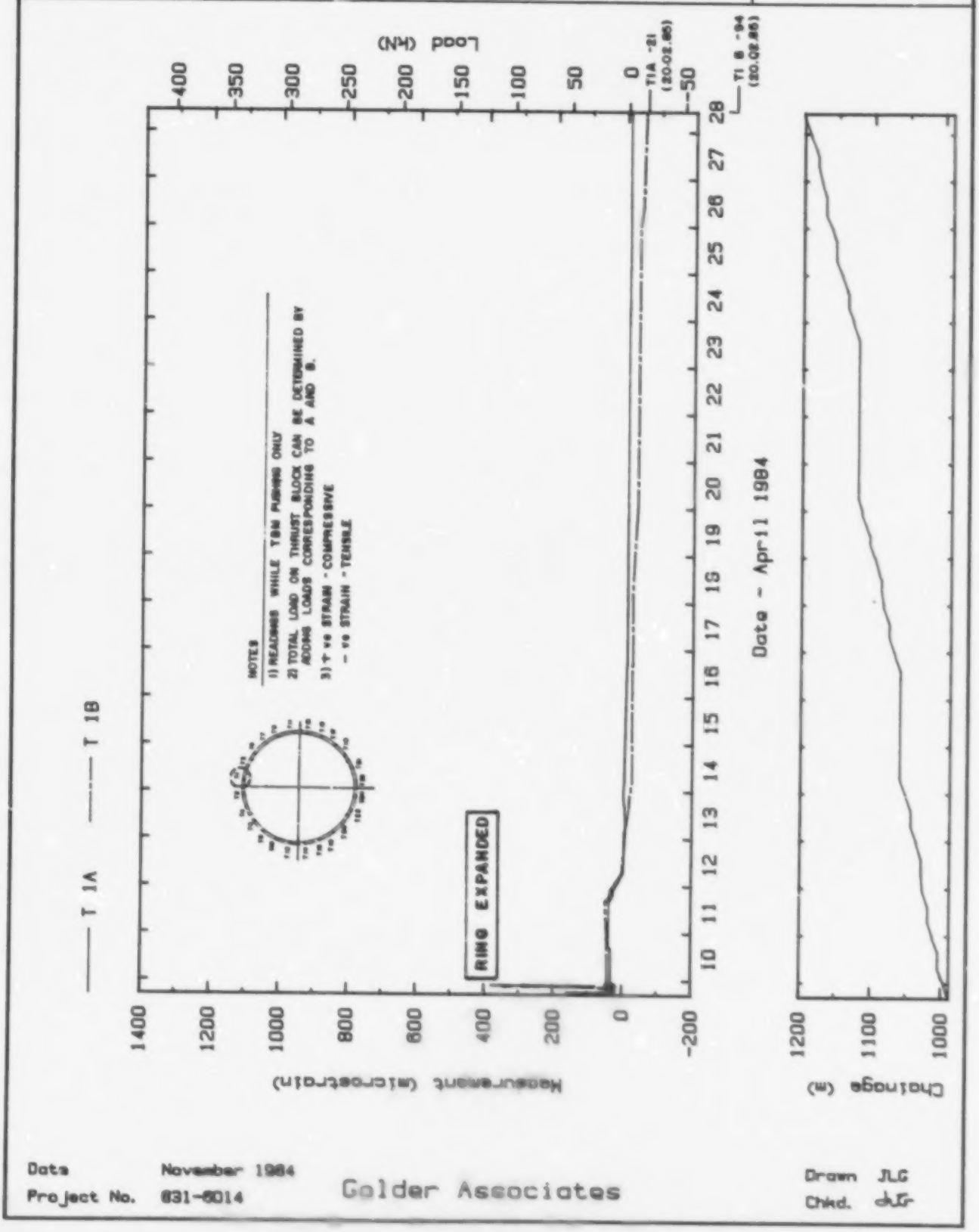
Golder Associates

Drawn JLG

Chkd.

THRUST BLOCK STRAIN MEASUREMENTS
Upper section - East side (No. 1) ch. 984m

FIGURE C.24



Date November 1984
Project No. 831-6014

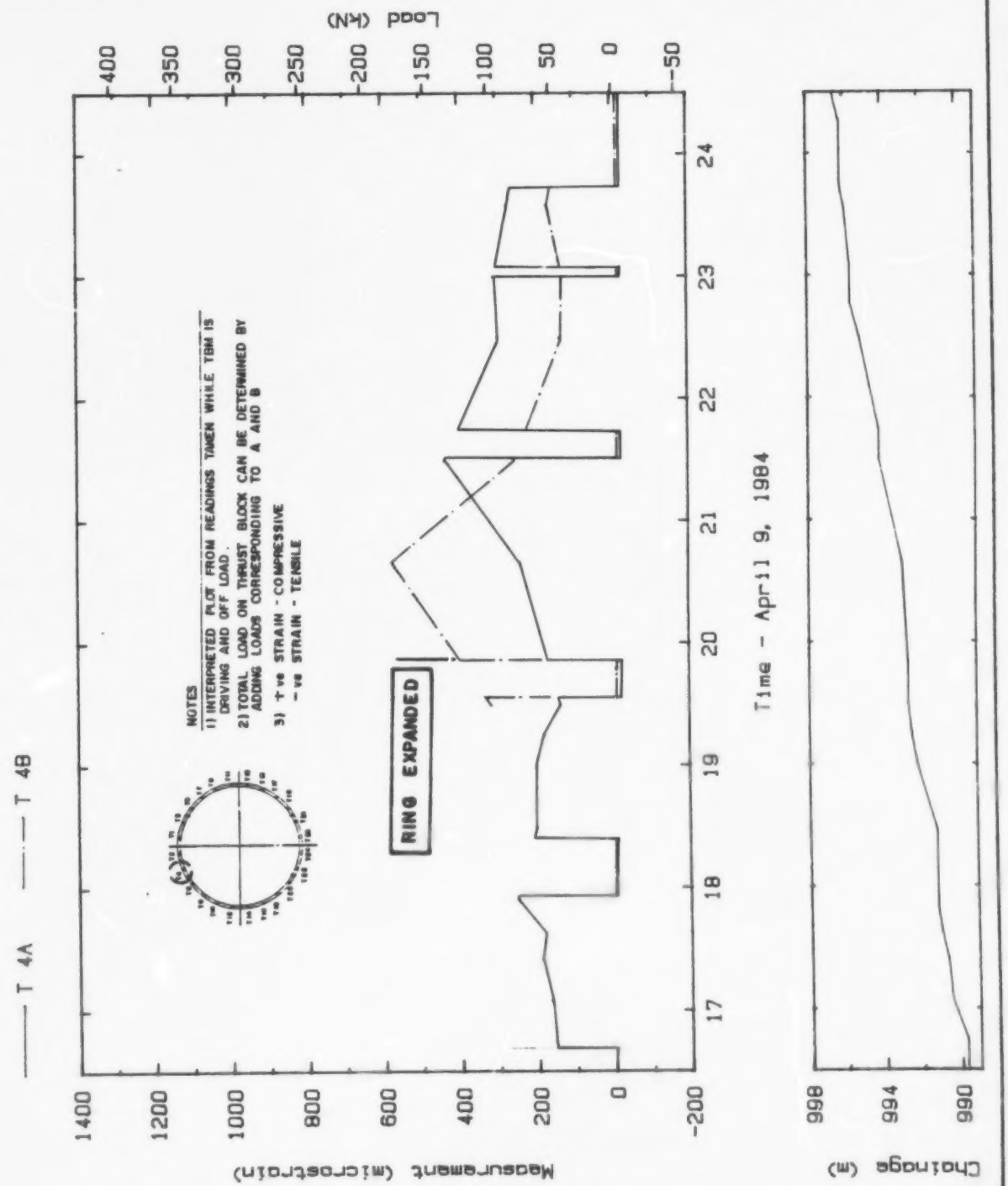
Golder Associates

Drawn JLG
Chkd.

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 4) ch. 984m

FIGURE C.25



Date November 1984

Project No. 831-6014

Golder Associates

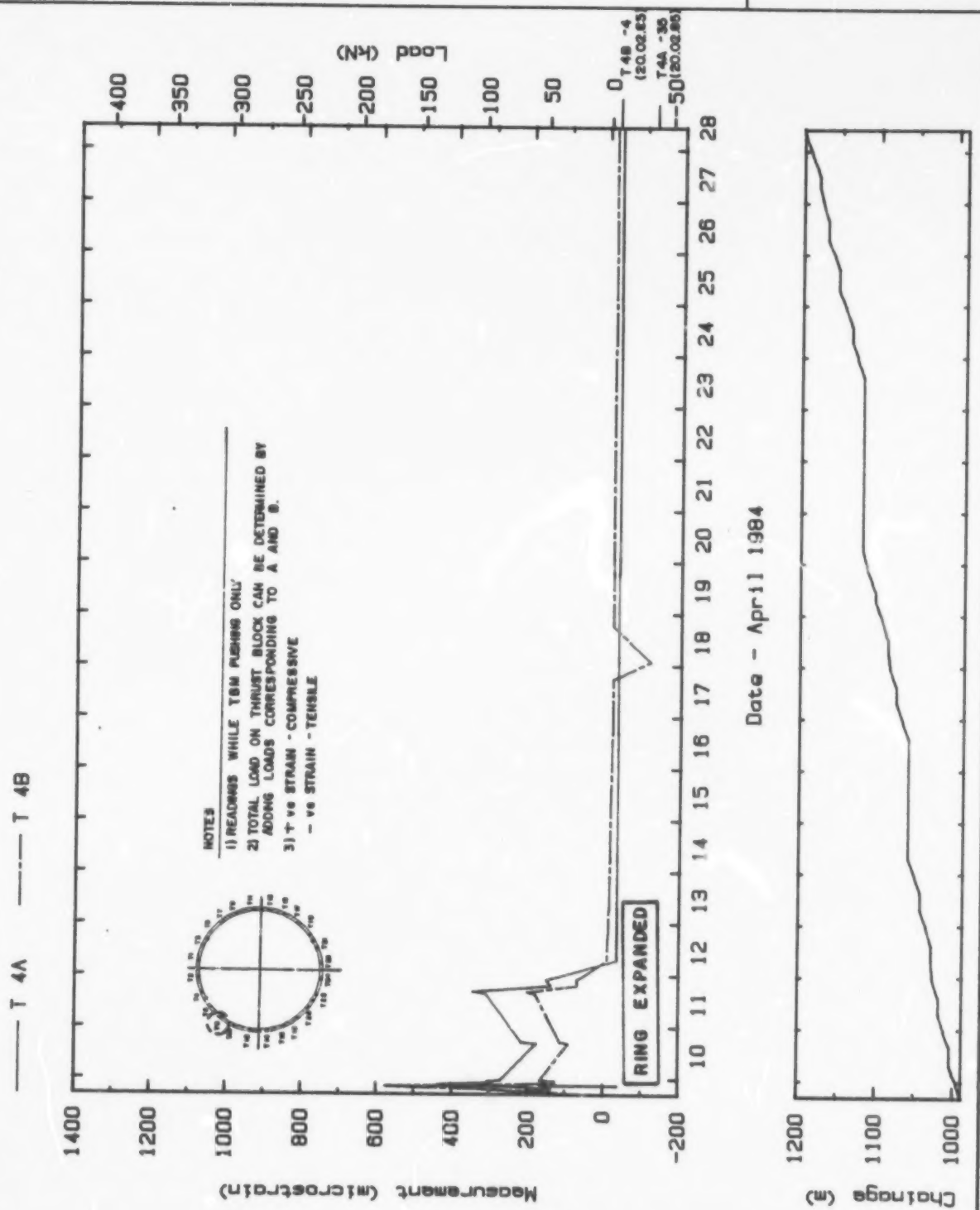
Drawn JLG

Chkd. dJG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 4) ch. 984m

FIGURE C.26



Date November 1984

Project No. 831-6014

Golder Associates

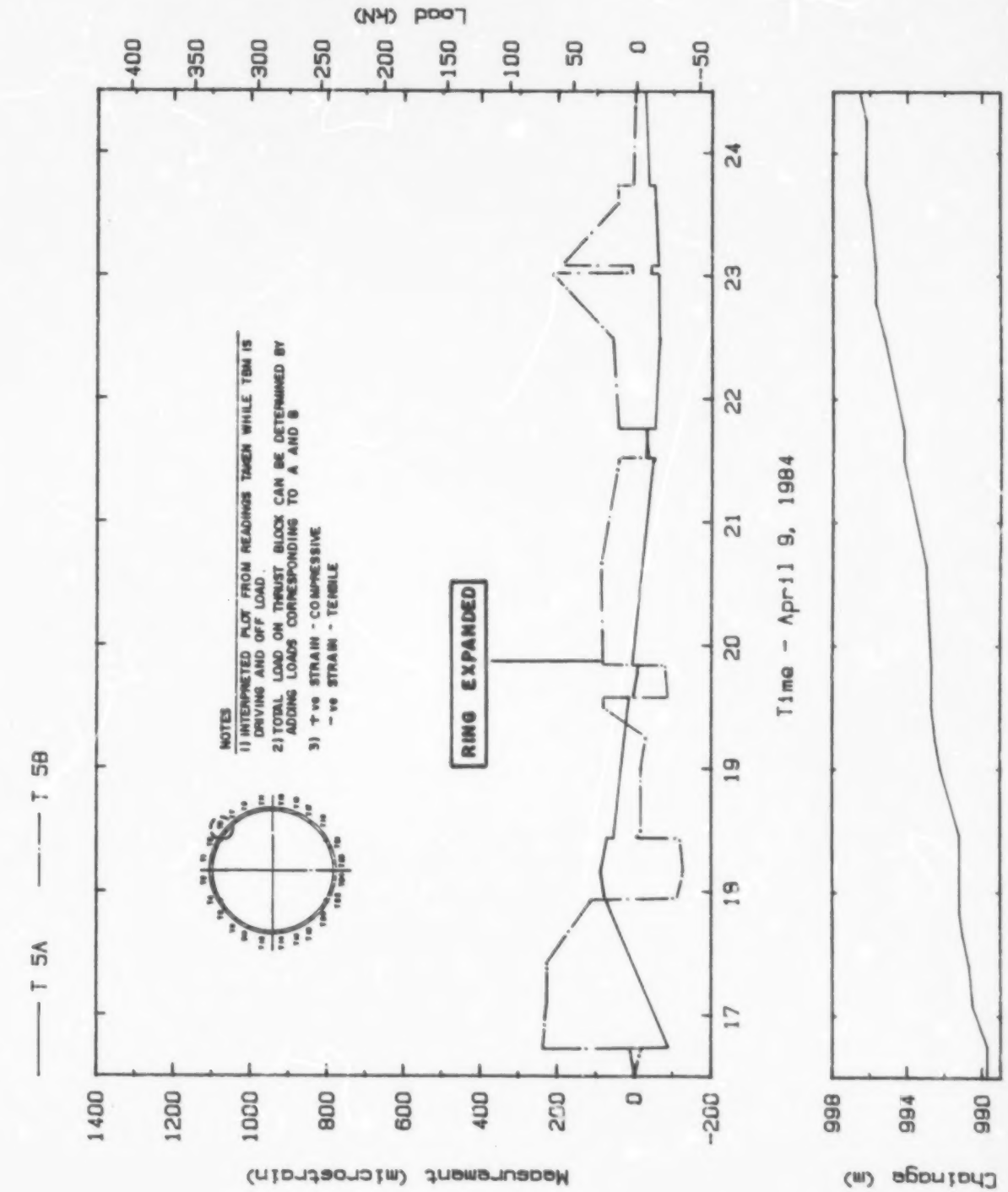
Drawn JLG

Chkd. dwg

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 5) ch. 984m

FIGURE C.27



Date November 1984

Project No. 831-6014

Golder Associates

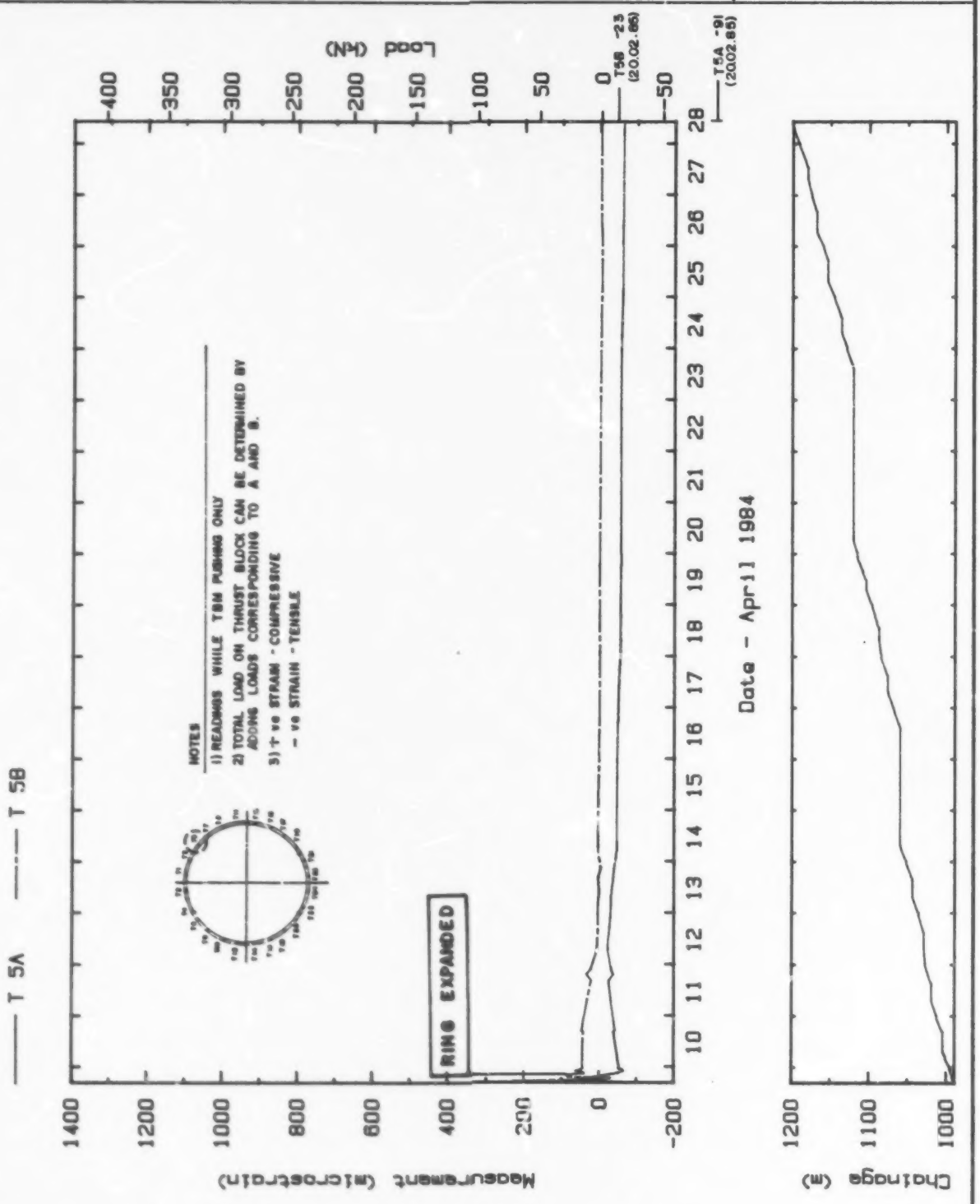
Drawn JLG

Chkd. JJR

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 5) ch. 984m

FIGURE C.28



Date November 1984

Project No. 831-8014

Golder Associates

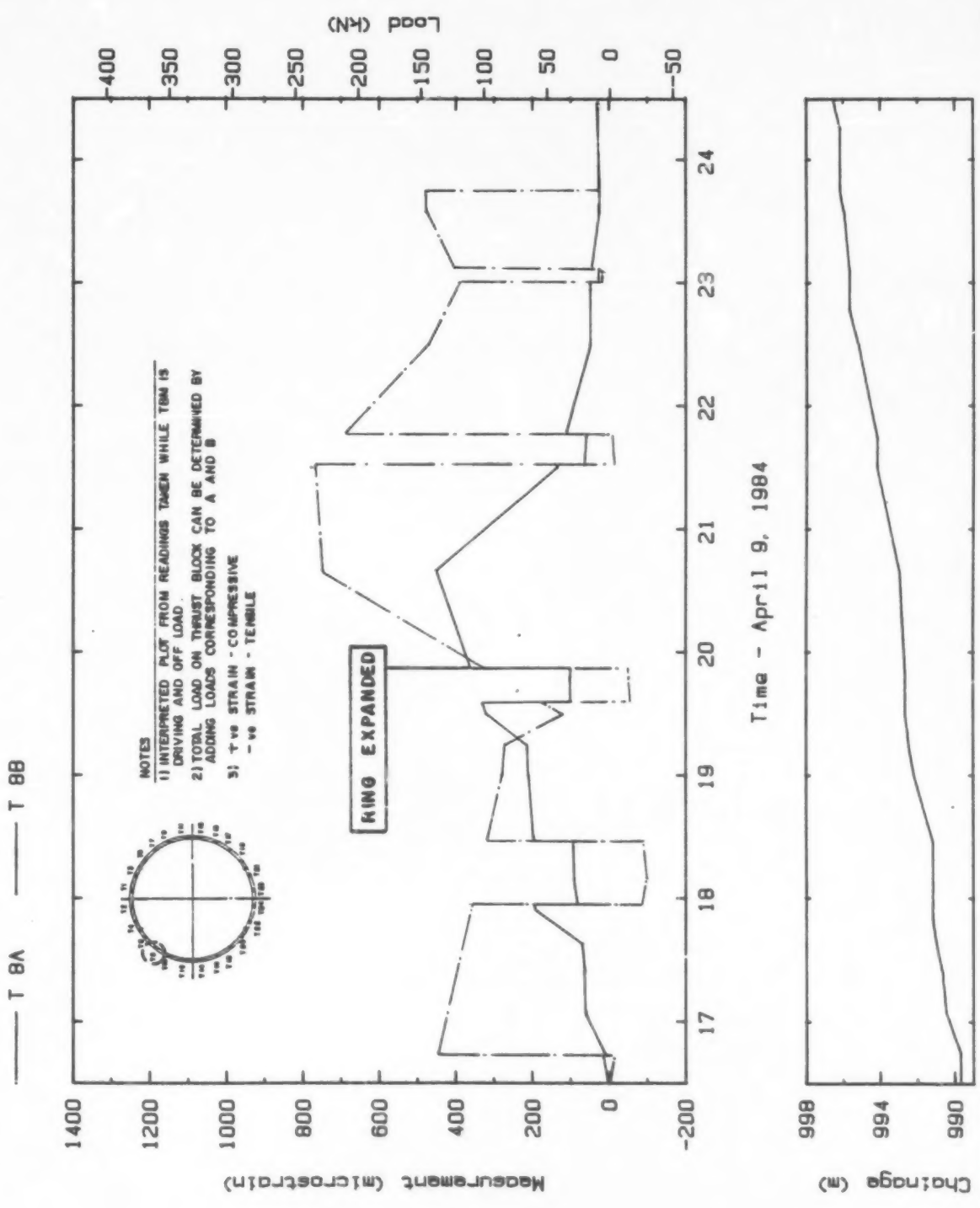
Drawn JLG

Chkd. JJG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 8) ch. 984m

FIGURE C.29



Date November 1984

Project No. 831-6014

Golder Associates

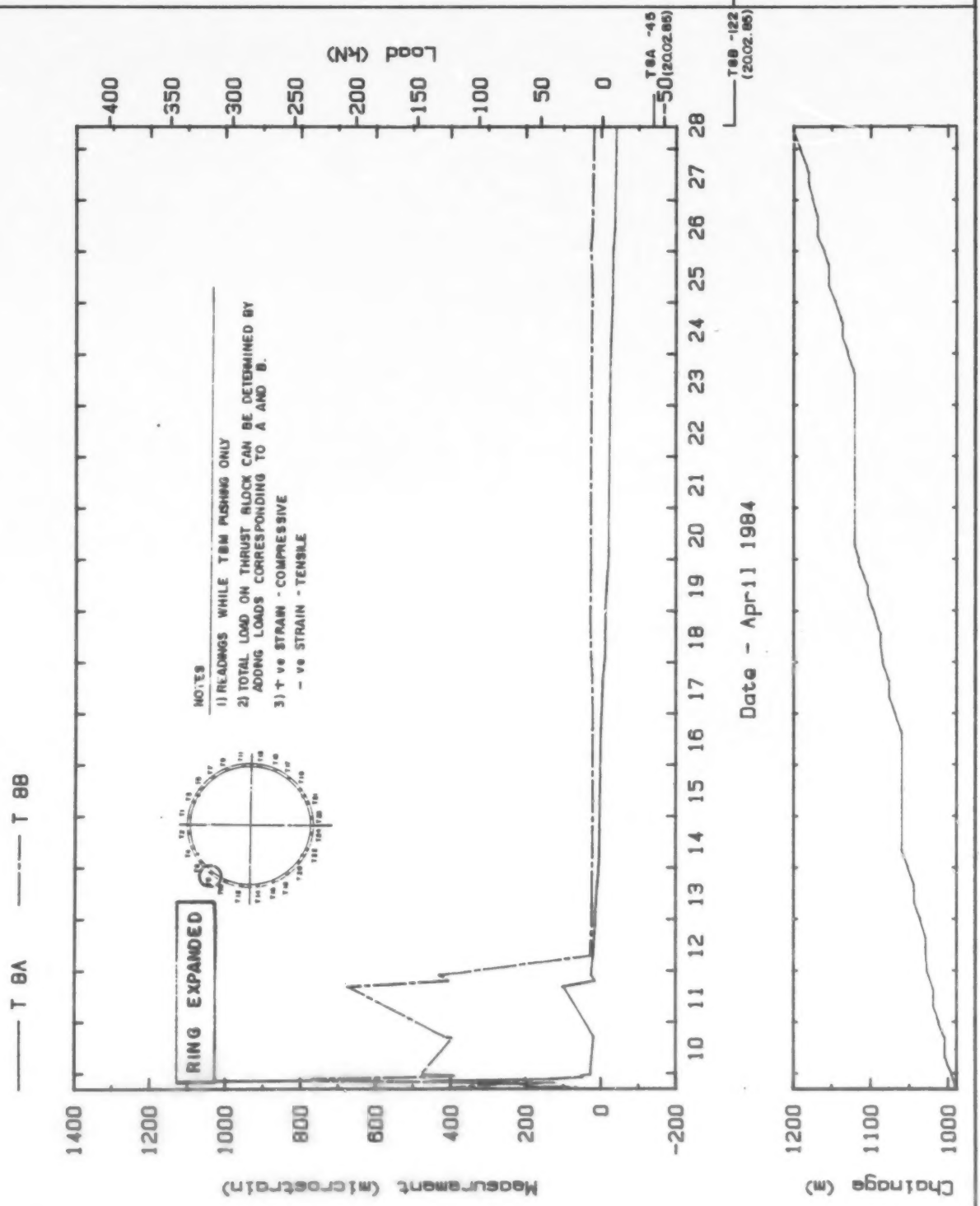
Drawn JLG

Chkd. JJP

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 8) ch. 984m

FIGURE C.30



Date November 1984

Project No. 831-6014

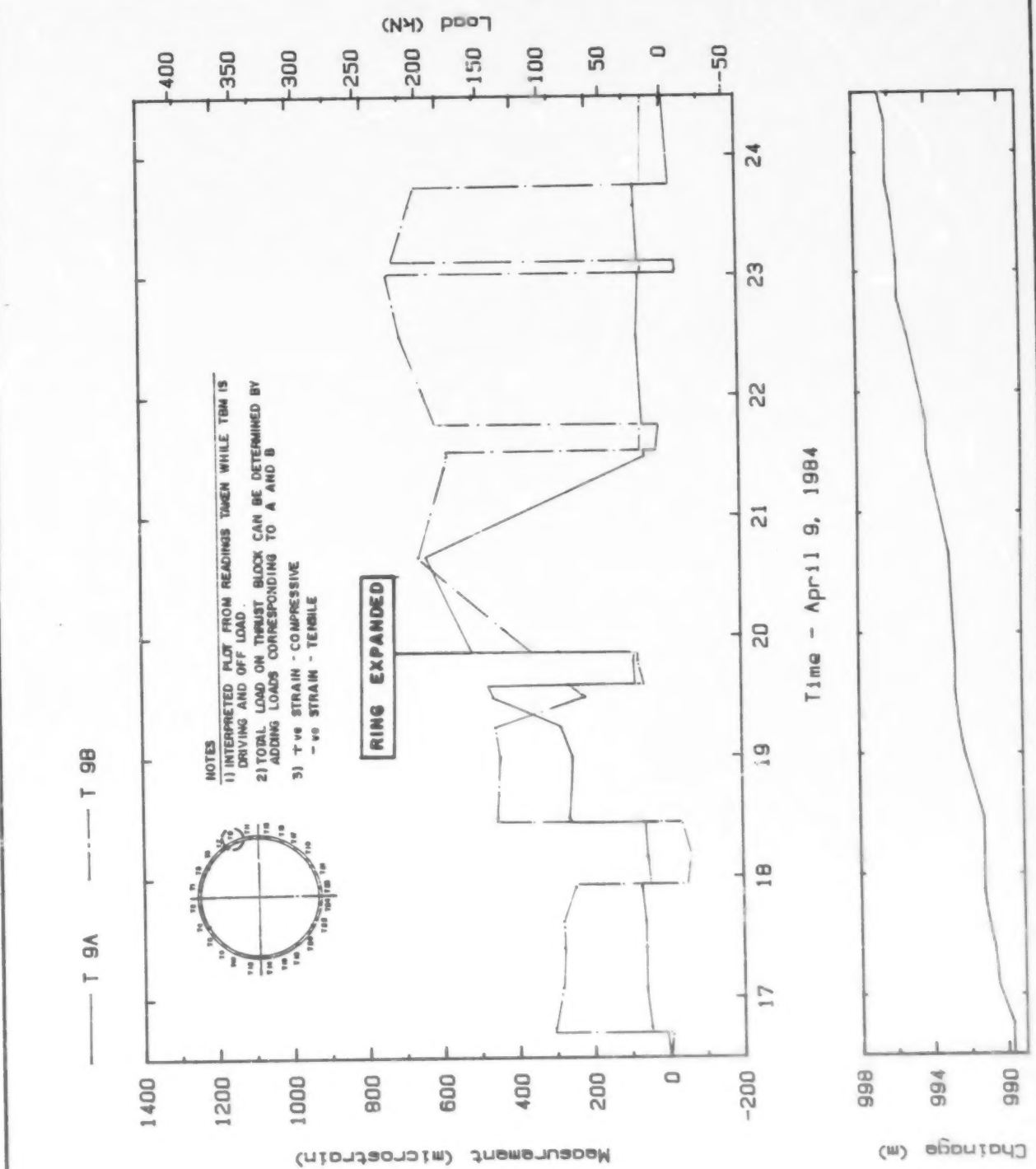
Golder Associates

Drawn JLG

Chkd. dJr

THRUST BLOCK STRAIN MEASUREMENTS
Upper section - East side (No. 9) ch. 984m

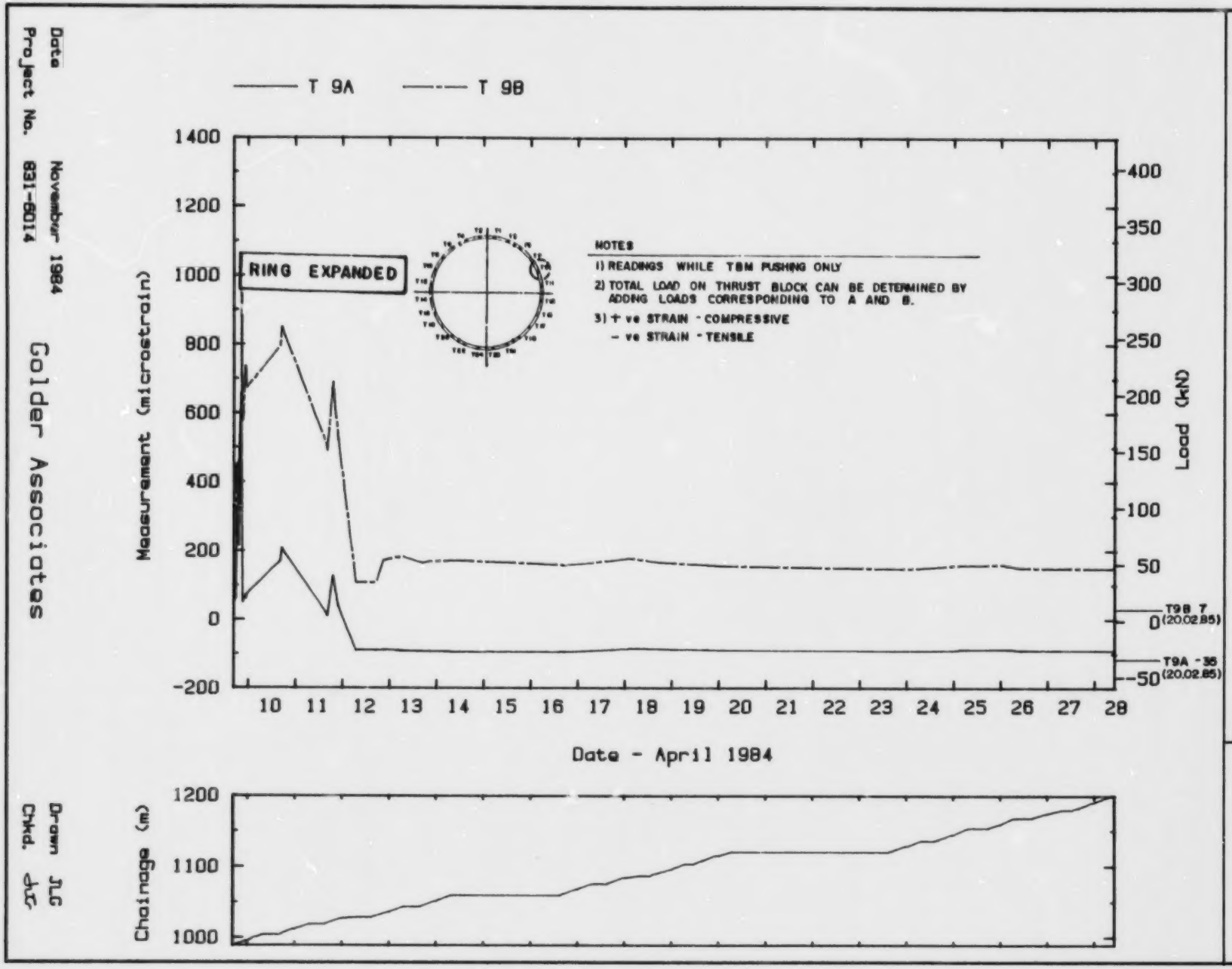
FIGURE C.31



Date November 1984
Project No. 831-5014

Golder Associates

Drawn JLG
Chkd. JJF


T 9A
T 9B
RING EXPANDED
NOTES
1) READINGS WHILE TBM PUSHING ONLY
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B.
3) + ve STRAIN - COMPRESSIVE
- ve STRAIN - TENSILE
Measurement (microstrain)
Load (MN)
T9B 7 (20.02.85)
T9A -35 (20.02.85)
Date - April 1984
Chainage (m)

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 9) ch. 984m

FIGURE C.32

Date November 1984

Project No. 831-5014

Golder Associates

Drawn JLG

Chkd. JGC

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 12) ch. 984m

FIGURE C.33

Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dlr

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 12) ch. 984m

FIGURE C.34

Date November 1984

Project No. 831-6014

Golder Associates

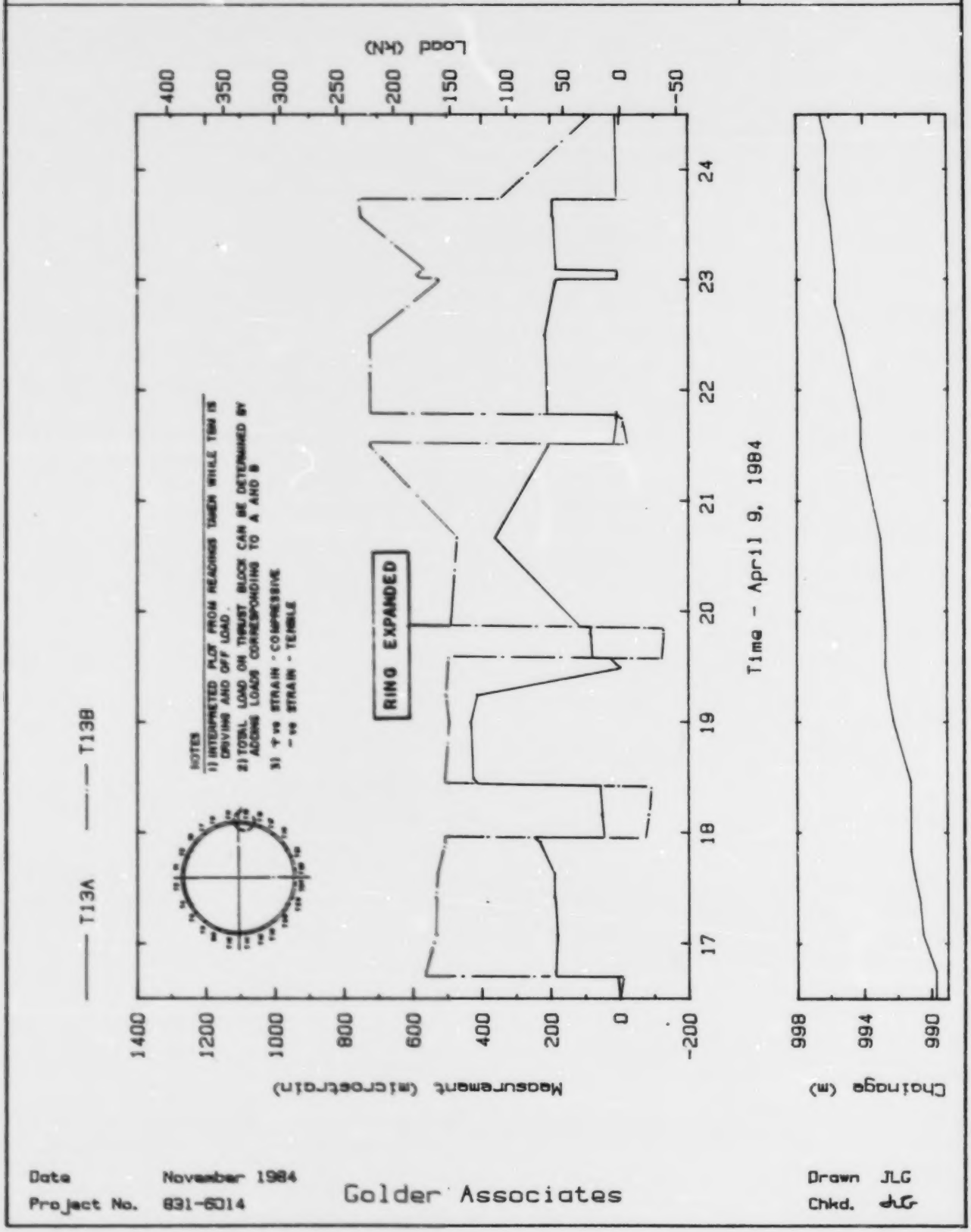
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 13) ch. 984m

FIGURE C.35



Date November 1984

Project No. 831-6014

Golder Associates

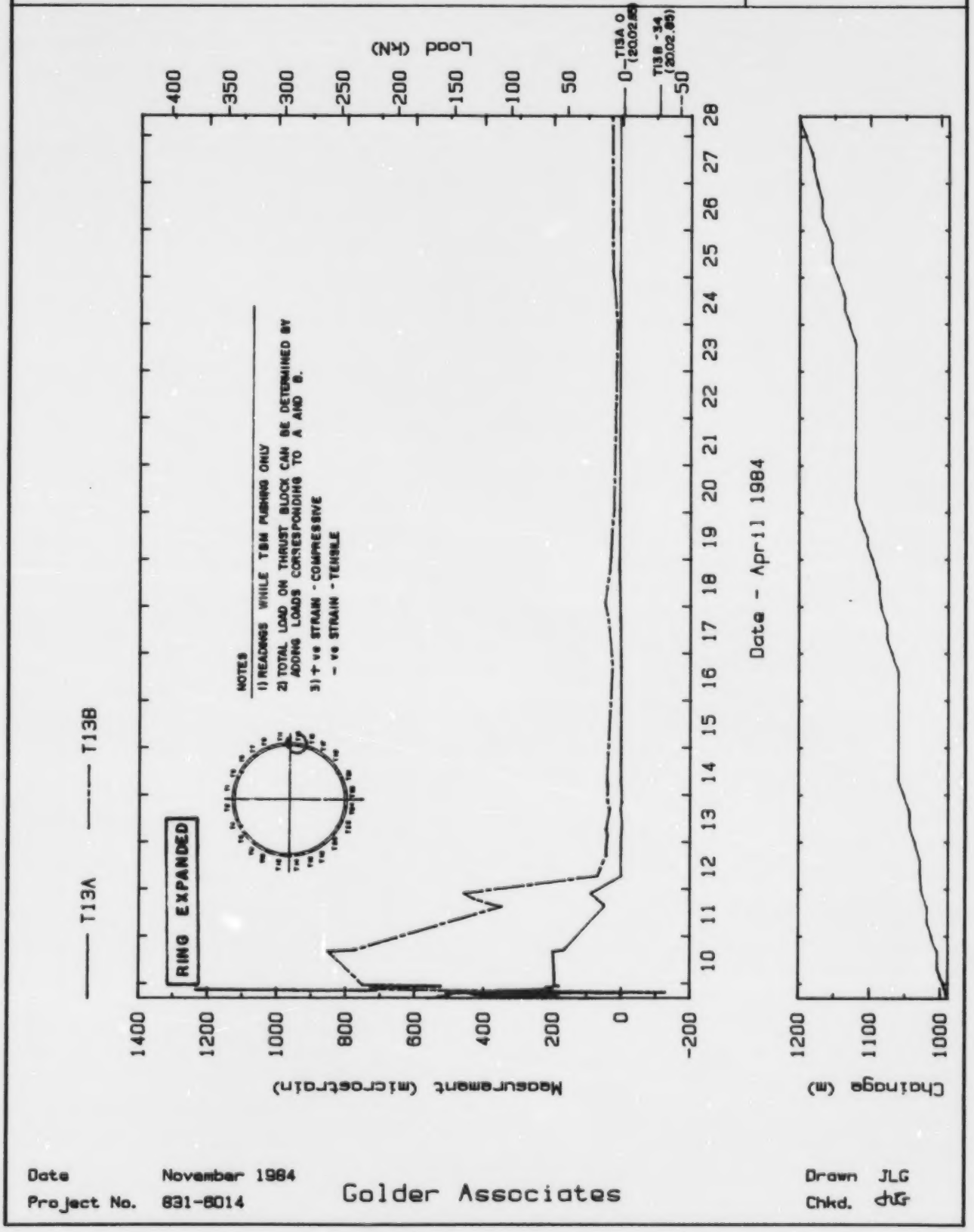
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 13) ch. 984m

FIGURE C.36



Date November 1984

Project No. 831-8014

Golder Associates

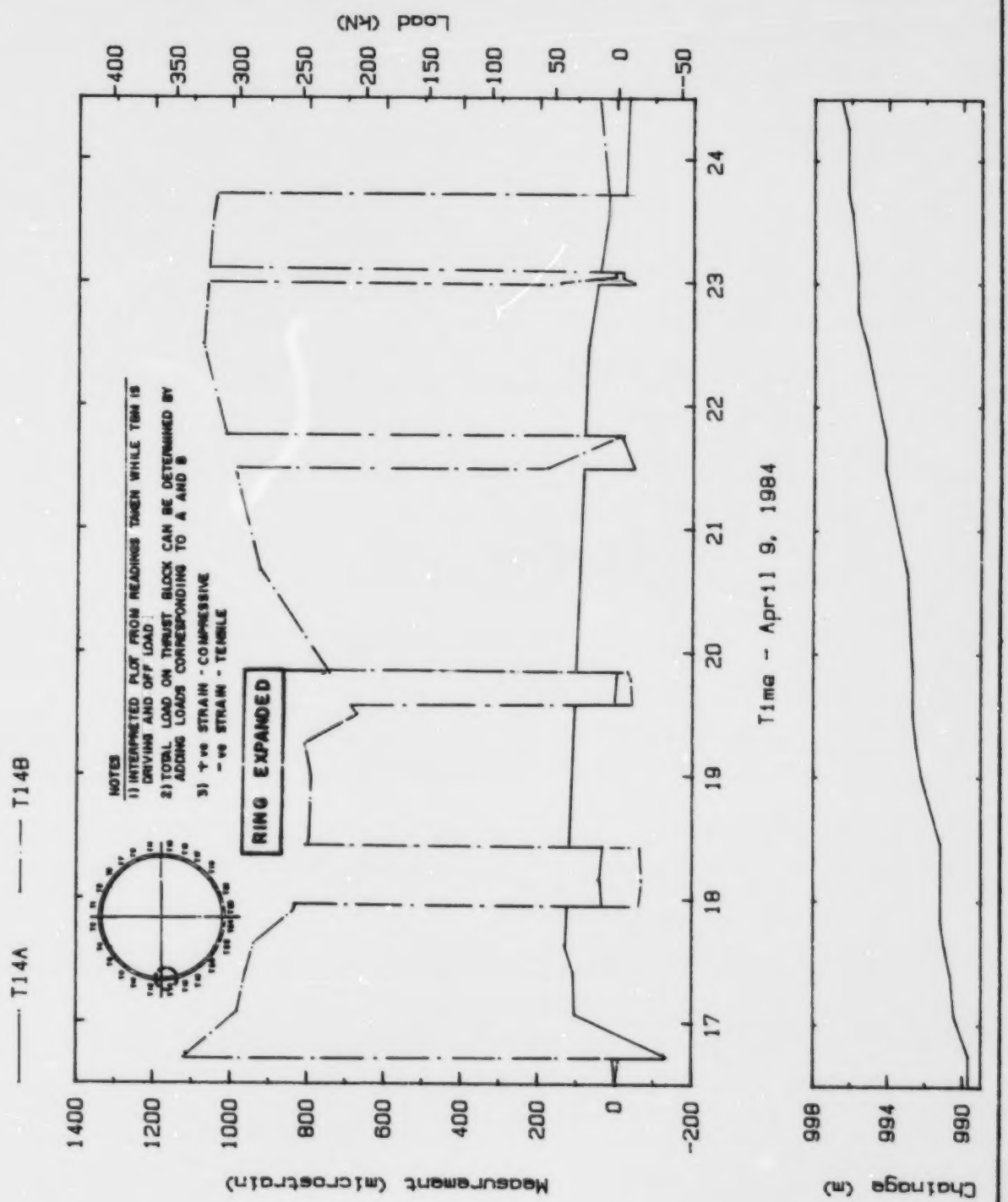
Drawn JLG

Chkd. dJG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 14) ch. 984m

FIGURE C.37



Date November 1984

Project No. 831-6014

Golder Associates

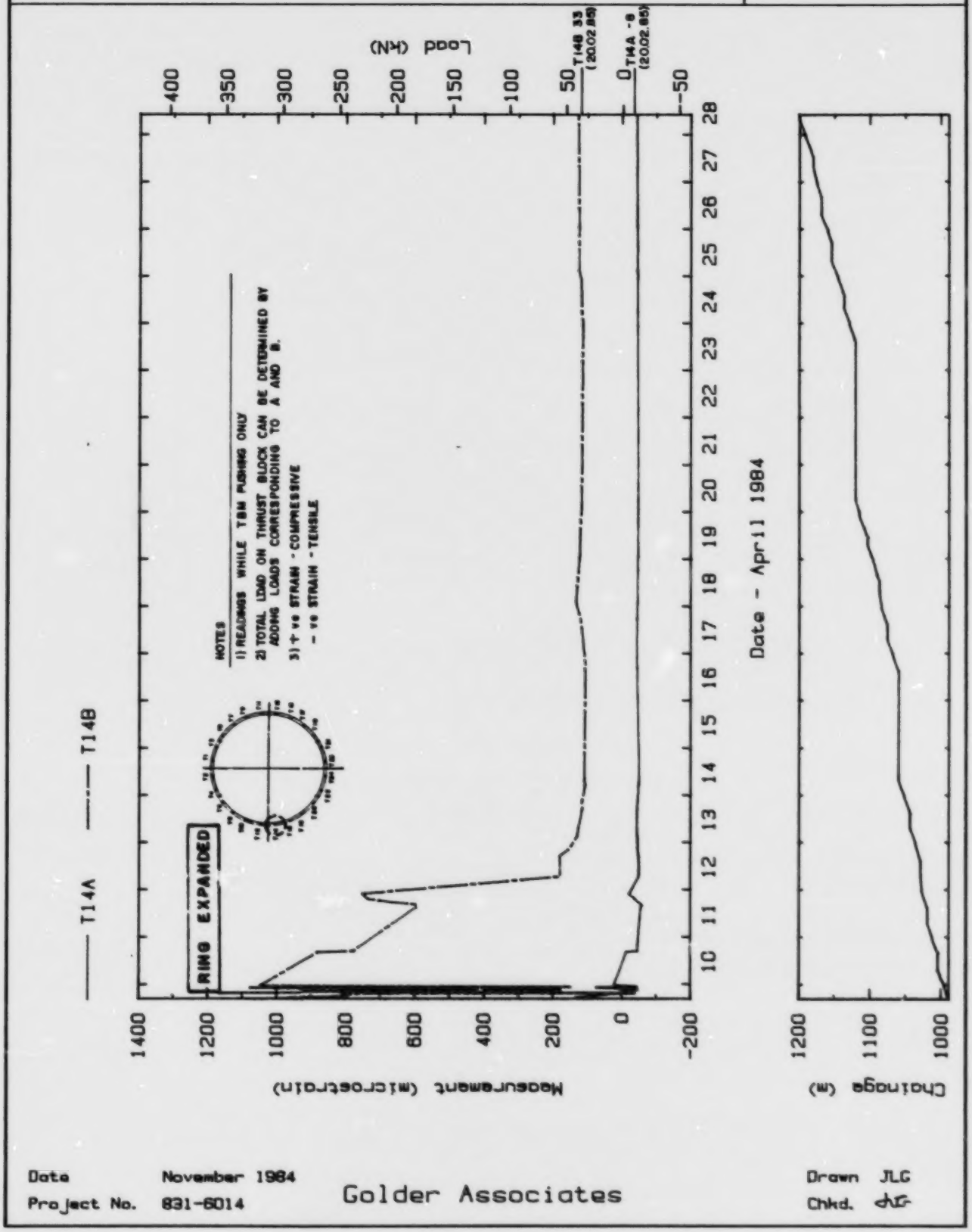
Drawn JLG

Chkd. dhr

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 14) ch. 984m

FIGURE C.38



Date November 1984

Project No. 831-6014

Golder Associates

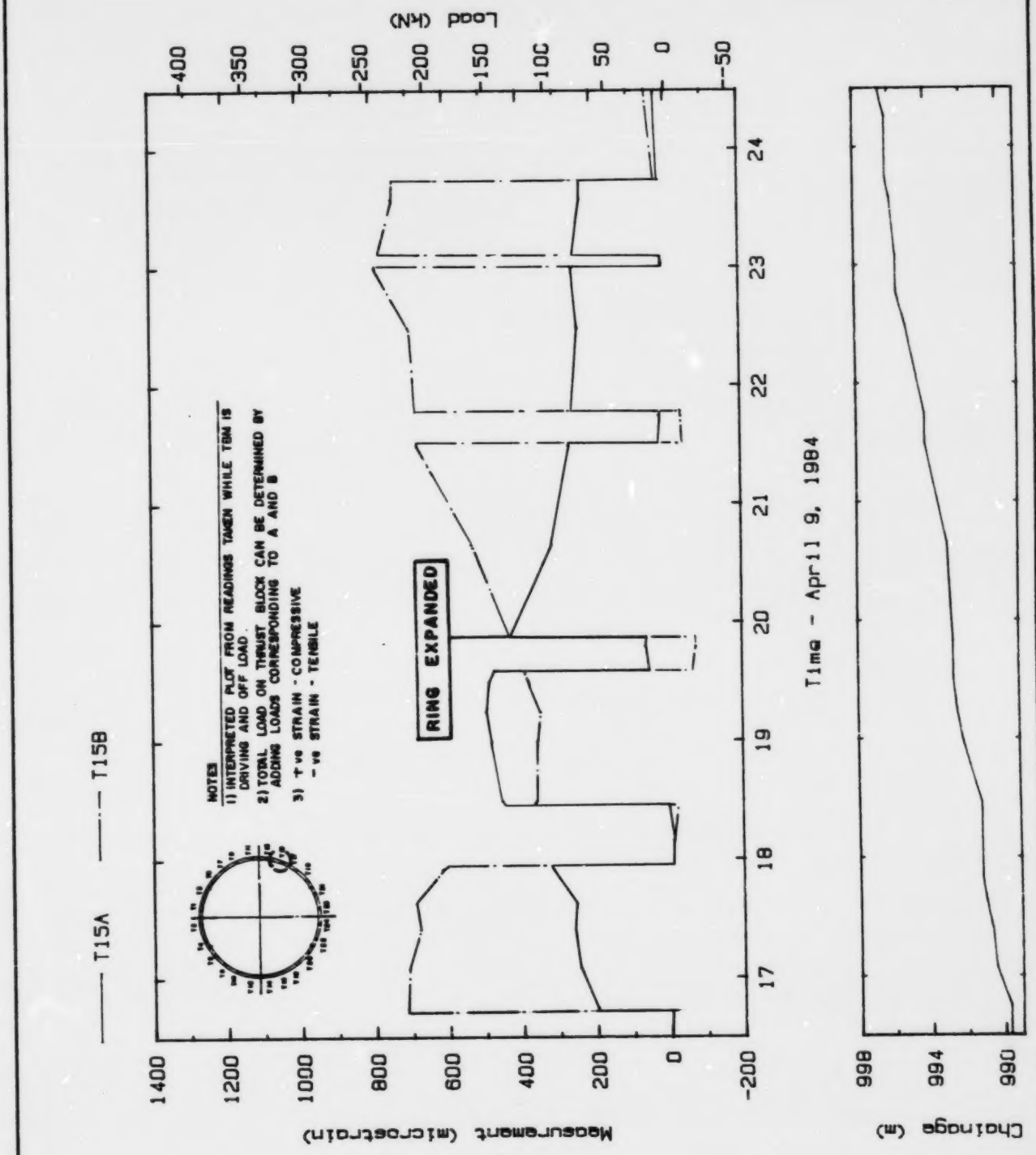
Drawn JLC

Chkd.

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 15) ch. 984m

FIGURE C.39



Date November 1984

Project No. 831-6014

Golder Associates

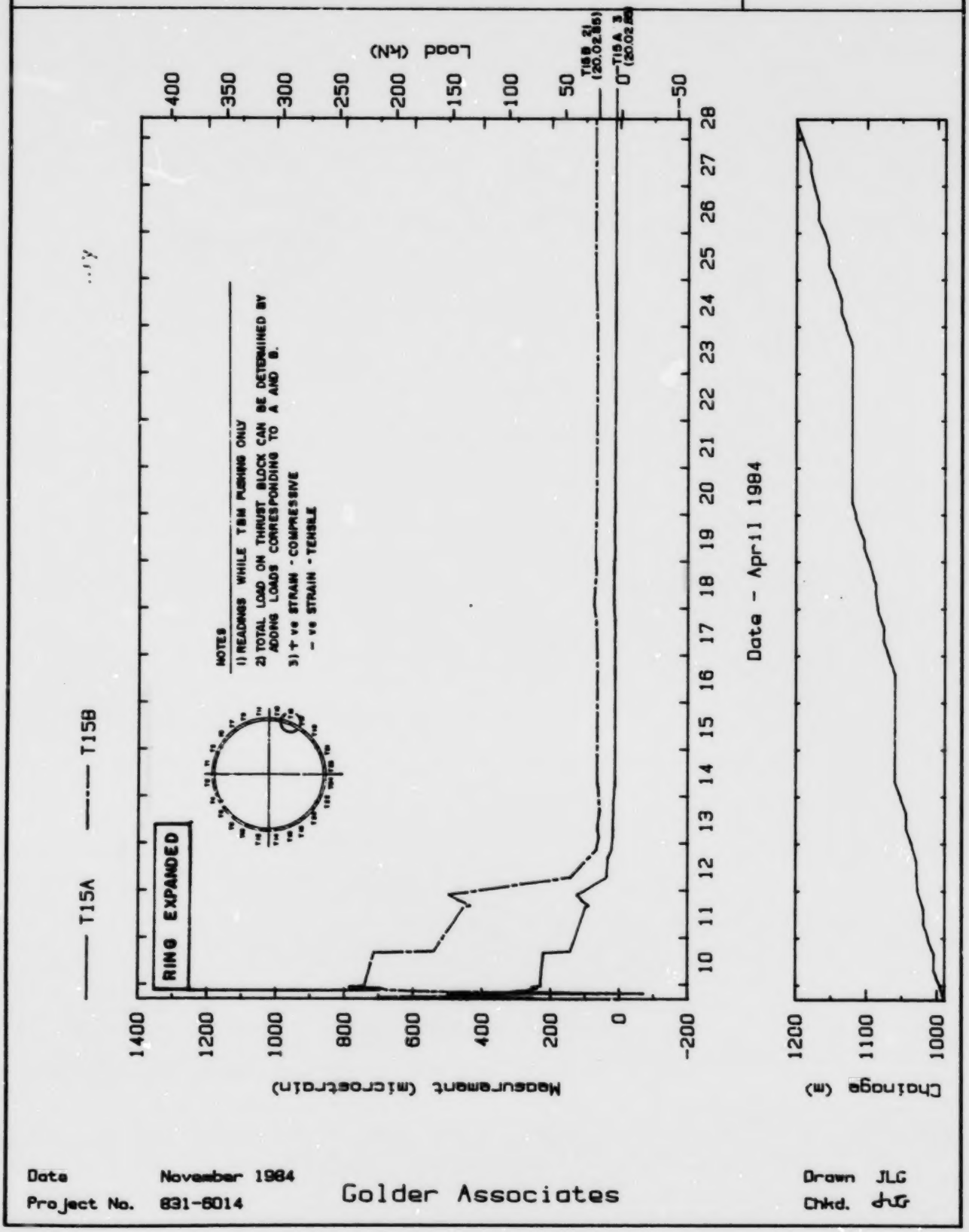
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 15) ch. 984m

FIGURE C.40



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dJG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 16) ch. 984m

FIGURE C.41

Date November 1984

Project No. 831-6014

Golder Associates

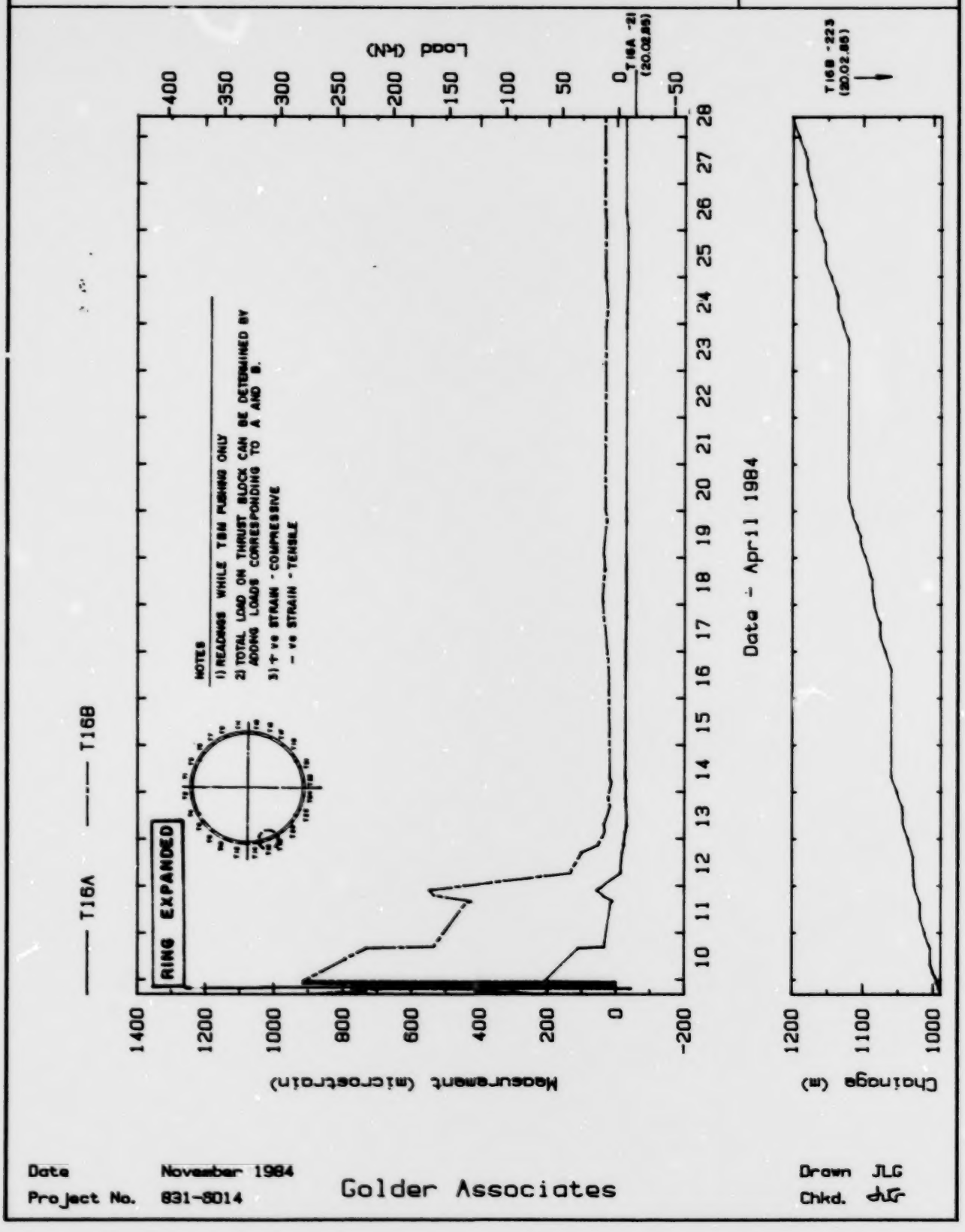
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 16) ch. 984m

FIGURE C.42.



Date November 1984

Project No. 831-8014

Golder Associates

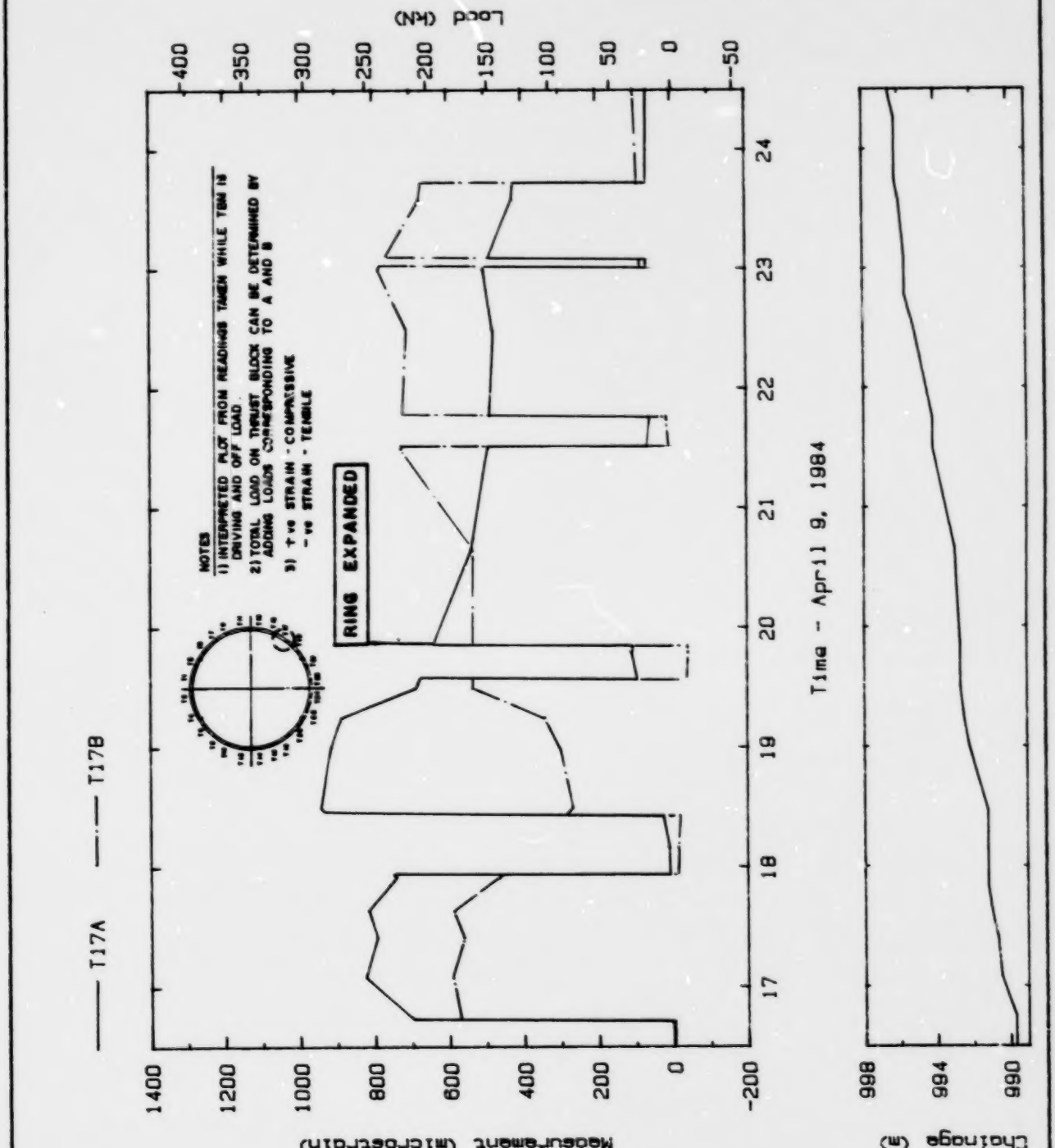
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 17) ch. 984m

FIGURE C.43



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 17) ch. 984m

FIGURE C.44

Date November 1984

Project No. 831-6014

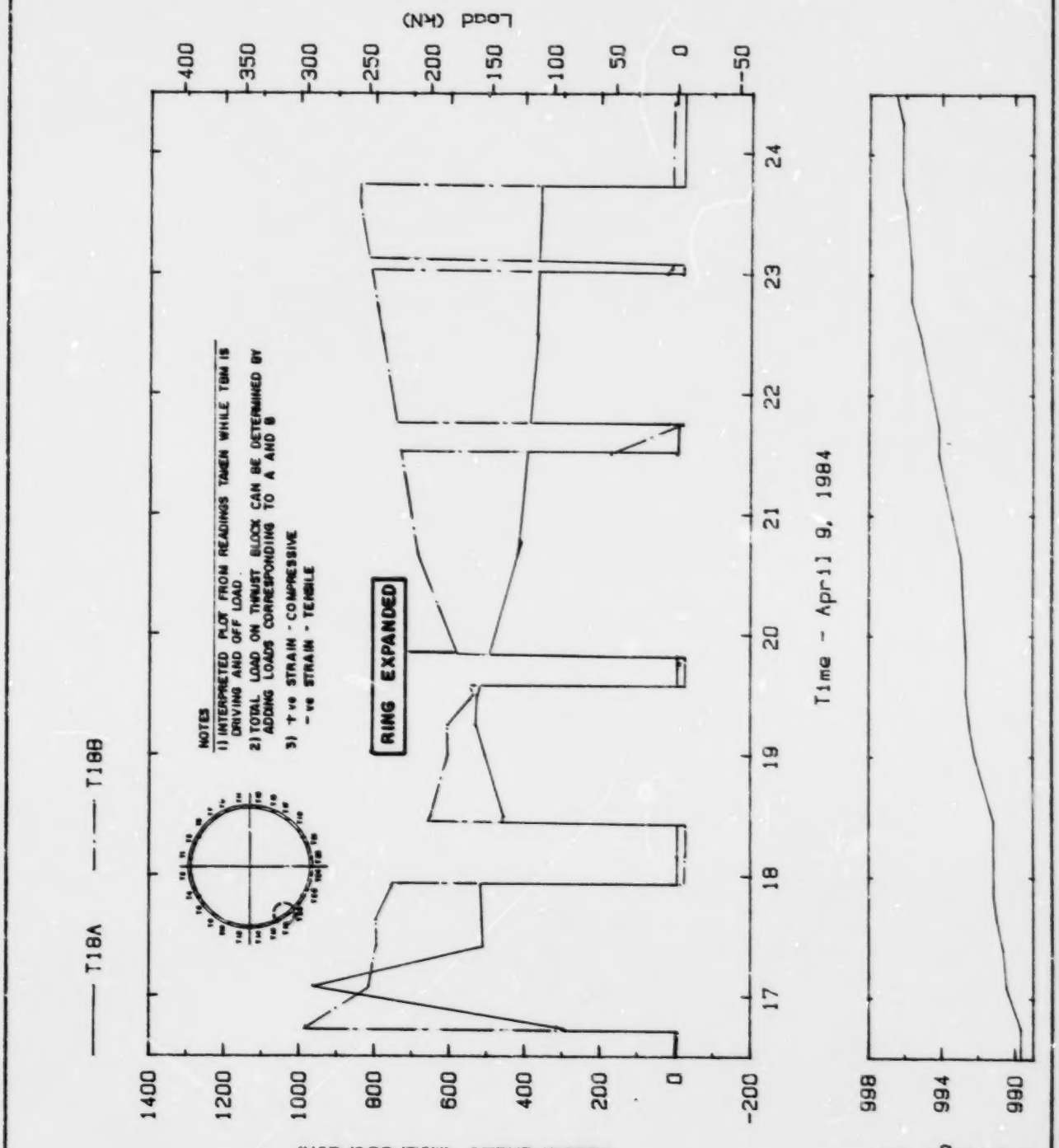
Golder Associates

Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS
Lower section - West side (No. 18) ch. 984m

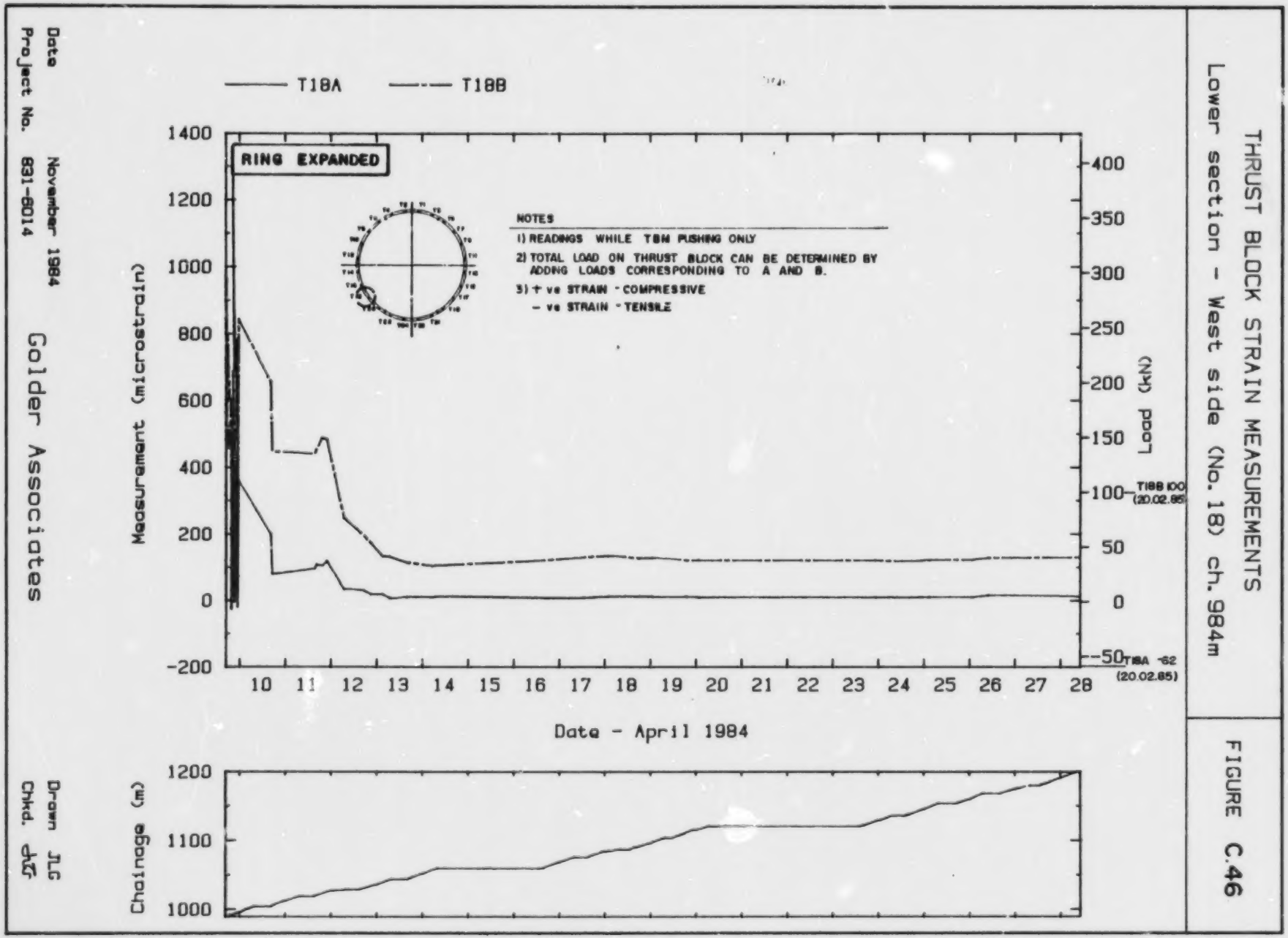
FIGURE C.45



Date November 1984
Project No. 831-6014

Golder Associates

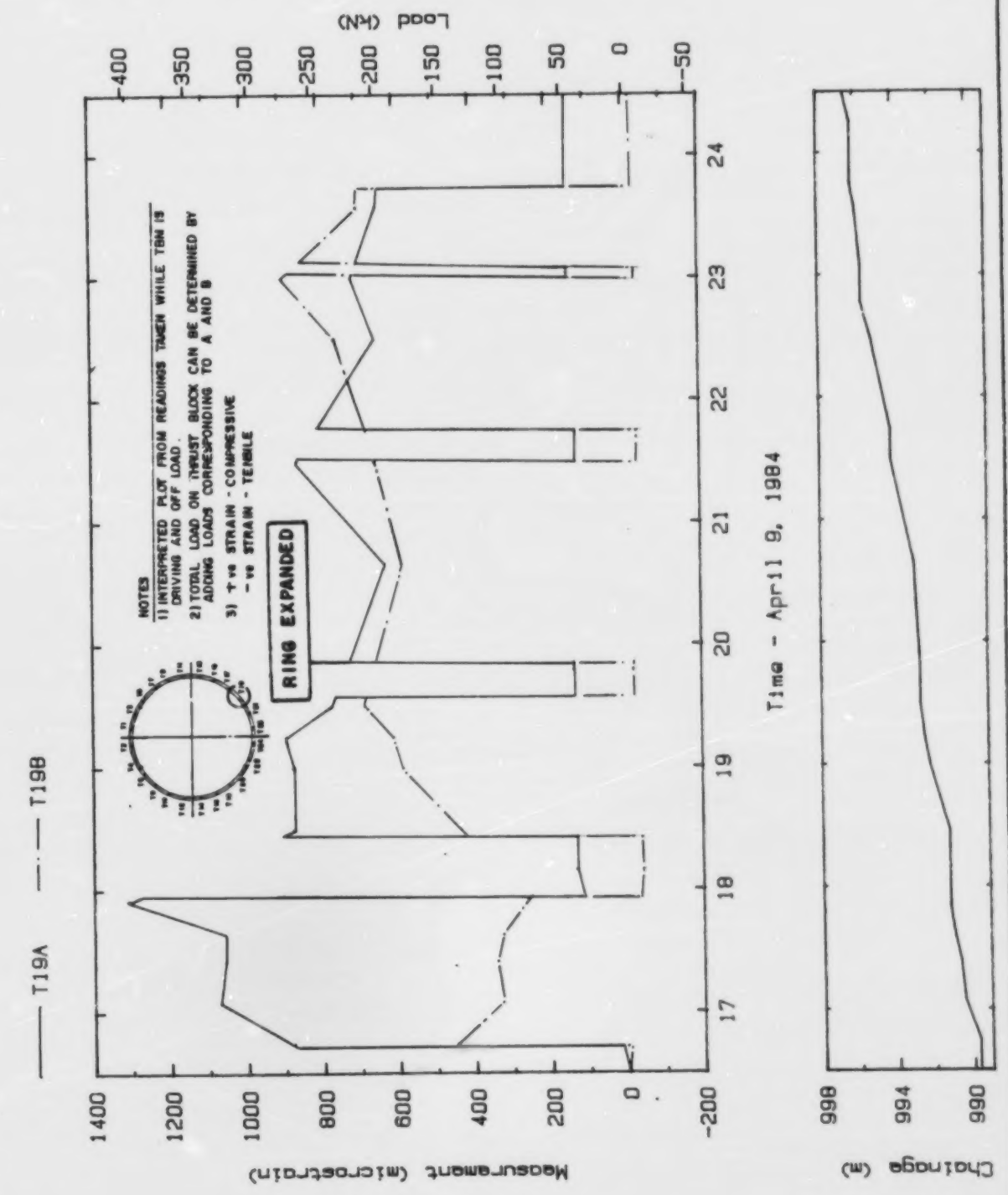
Drawn JLG
Chkd. JLG


THRUST BLOCK STRAIN MEASUREMENTS
Lower section - West side (No. 18) ch. 984m
FIGURE C.46
Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd. dkf
T18A
T18B
RING EXPANDED
NOTES
1) READINGS WHILE TBM PUSHING ONLY
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B.
3) + ve STRAIN - COMPRESSIVE
- ve STRAIN - TENSILE
Measurement (microstrain)
Load (kN)
T18B 100 (20.02.85)
T18A -62 (20.02.85)
Date - April 1984
Chainage (m)

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 19) ch. 984m

FIGURE C.47



Date November 1984

Project No. 831-6014

Golder Associates

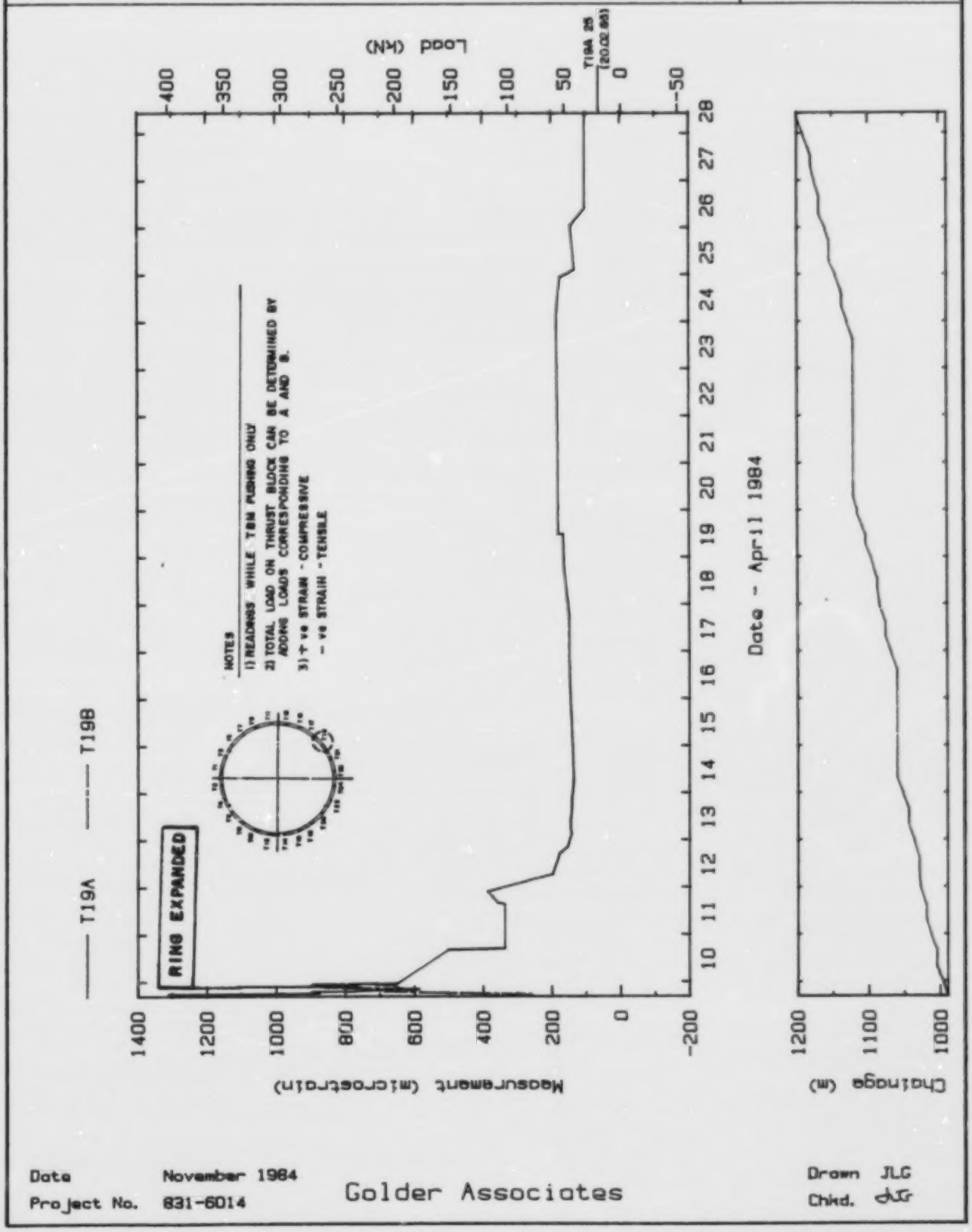
Drawn JLG

Chkd. dhg

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 19) ch. 984m

FIGURE C.48



Date November 1984

Project No. 831-6014

Golder Associates

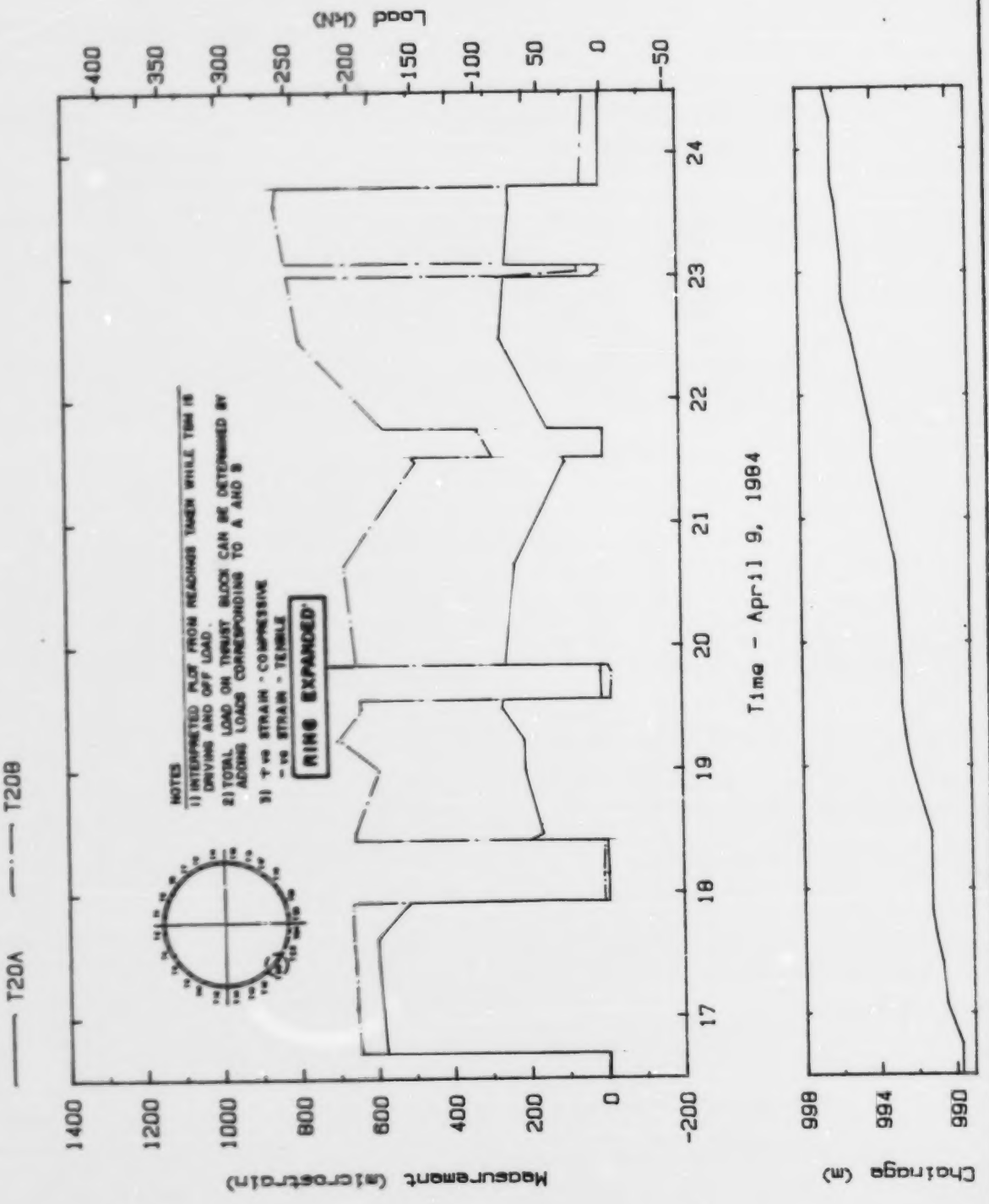
Drawn JLG

Chkd.

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 20) ch. 984m

FIGURE C.49



Date November 1984

Project No. 831-6014

Golder Associates

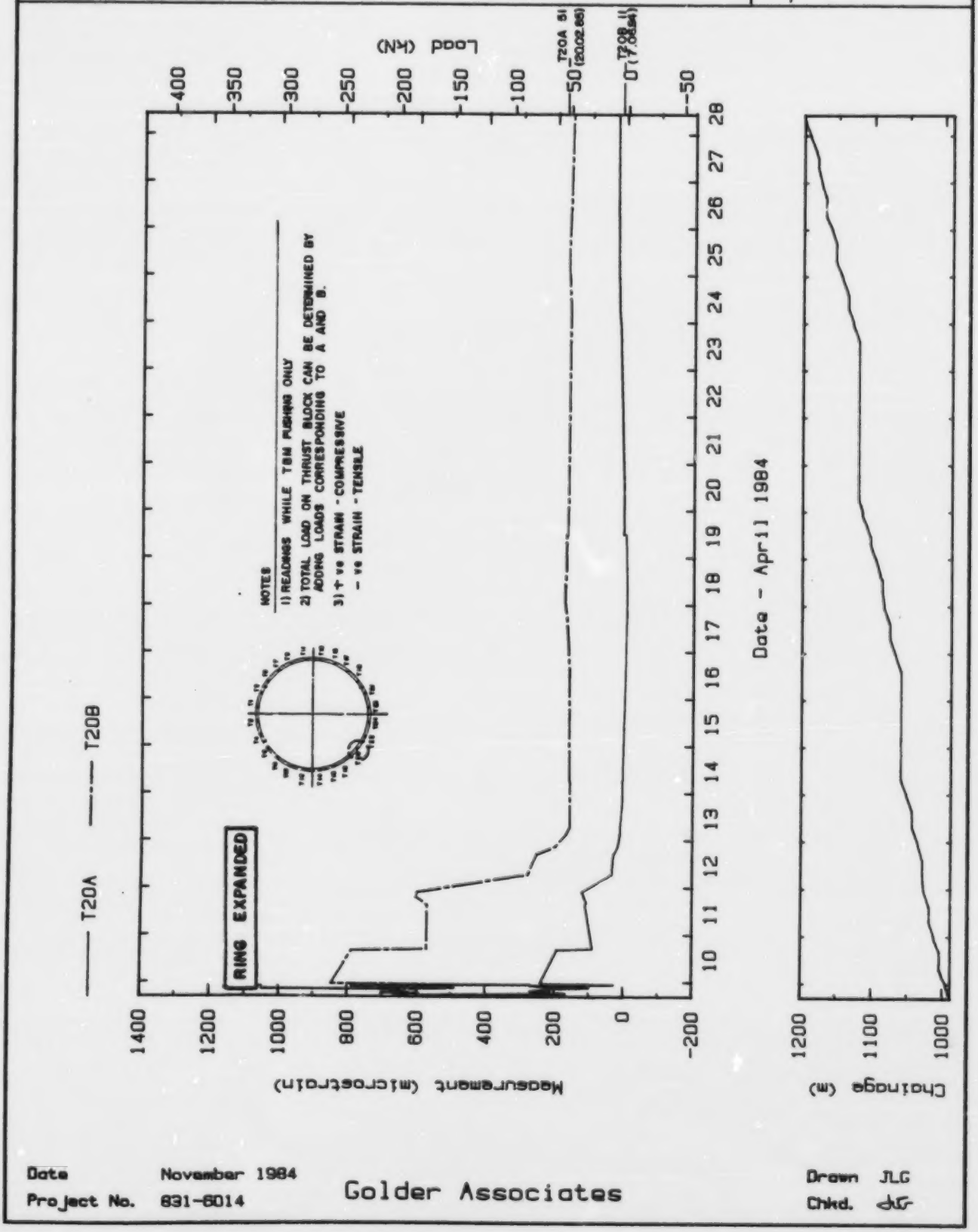
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 20) ch. 984m

FIGURE C.50



Date November 1984

Project No. 831-6014

Golder Associates

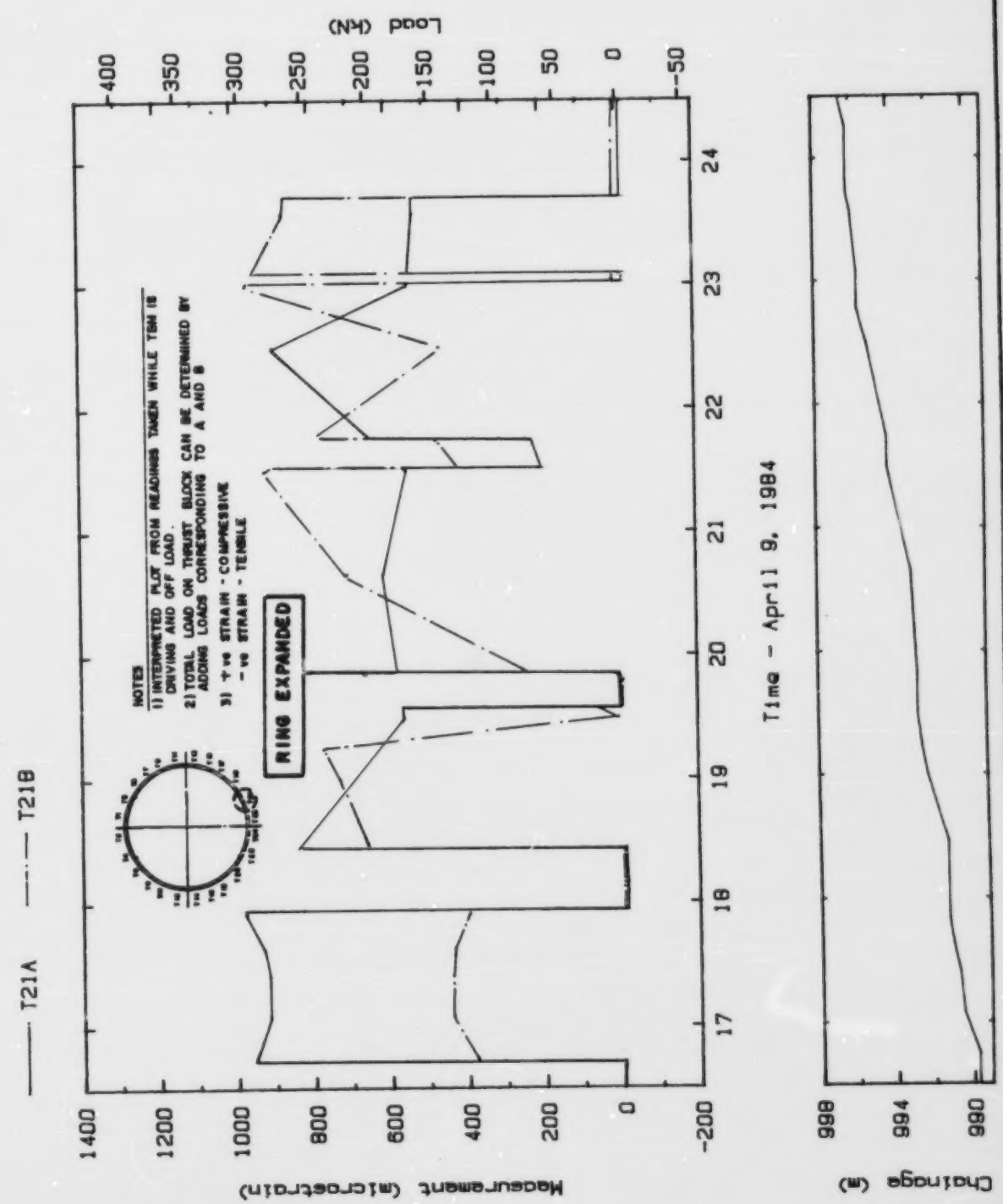
Drawn JLG

Chkd. dg

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 21) ch. 984m

FIGURE C.51



Data November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JJF

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 21) ch. 984m

FIGURE C.52

Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLC

Chkd. dvG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 22) ch. 984m

FIGURE C.53

Date November 1984

Project No. 831-6014

Golder Associates

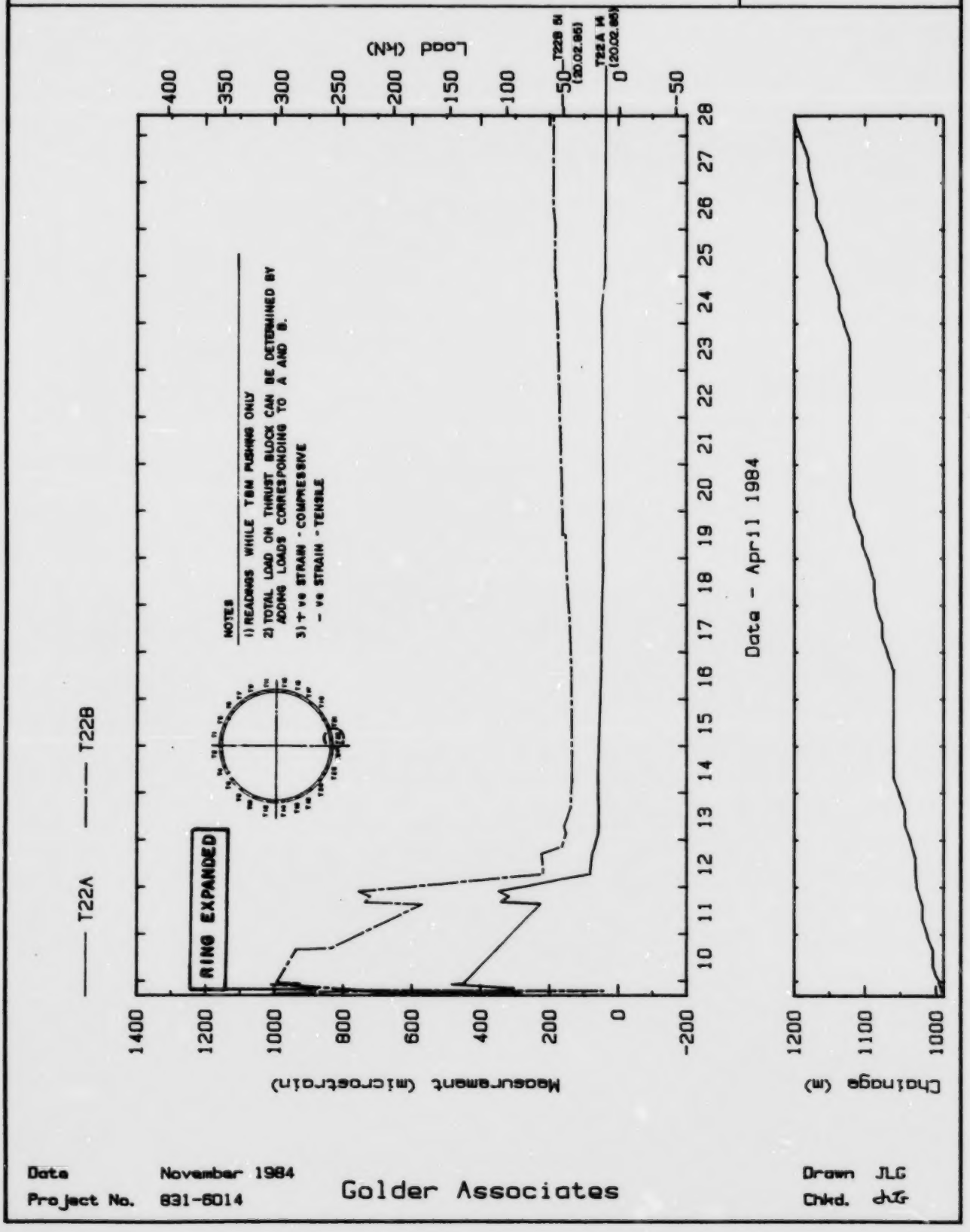
Drawn JLG

Chkd. dJG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 22) ch. 984m

FIGURE C.54



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JJG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 23) ch. 984m

FIGURE C.55

Date November 1984

Project No. 831-6014

Golder Associates

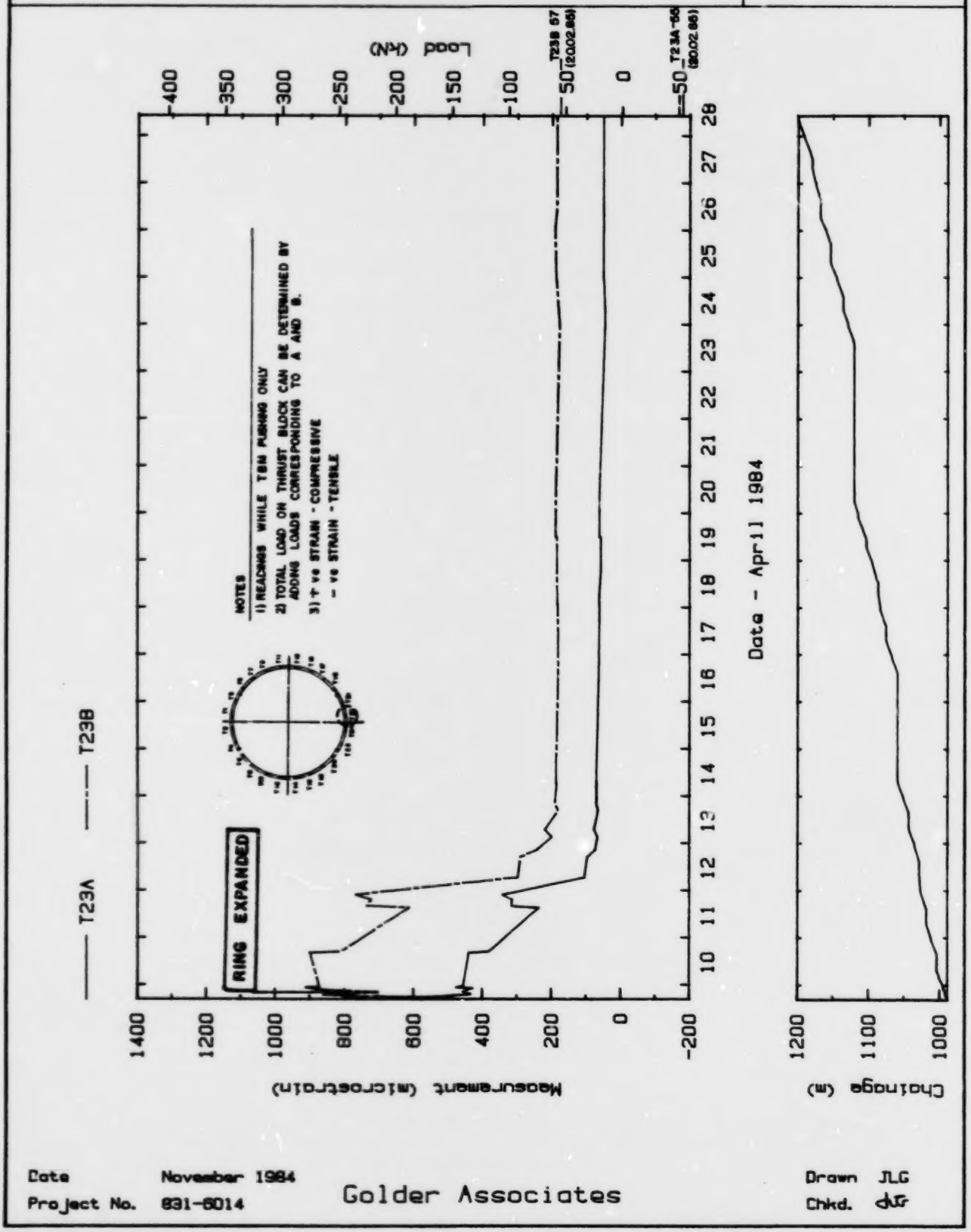
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 23) ch. 984m

FIGURE C.56



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dJF

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 24) ch. 984m

FIGURE C.57

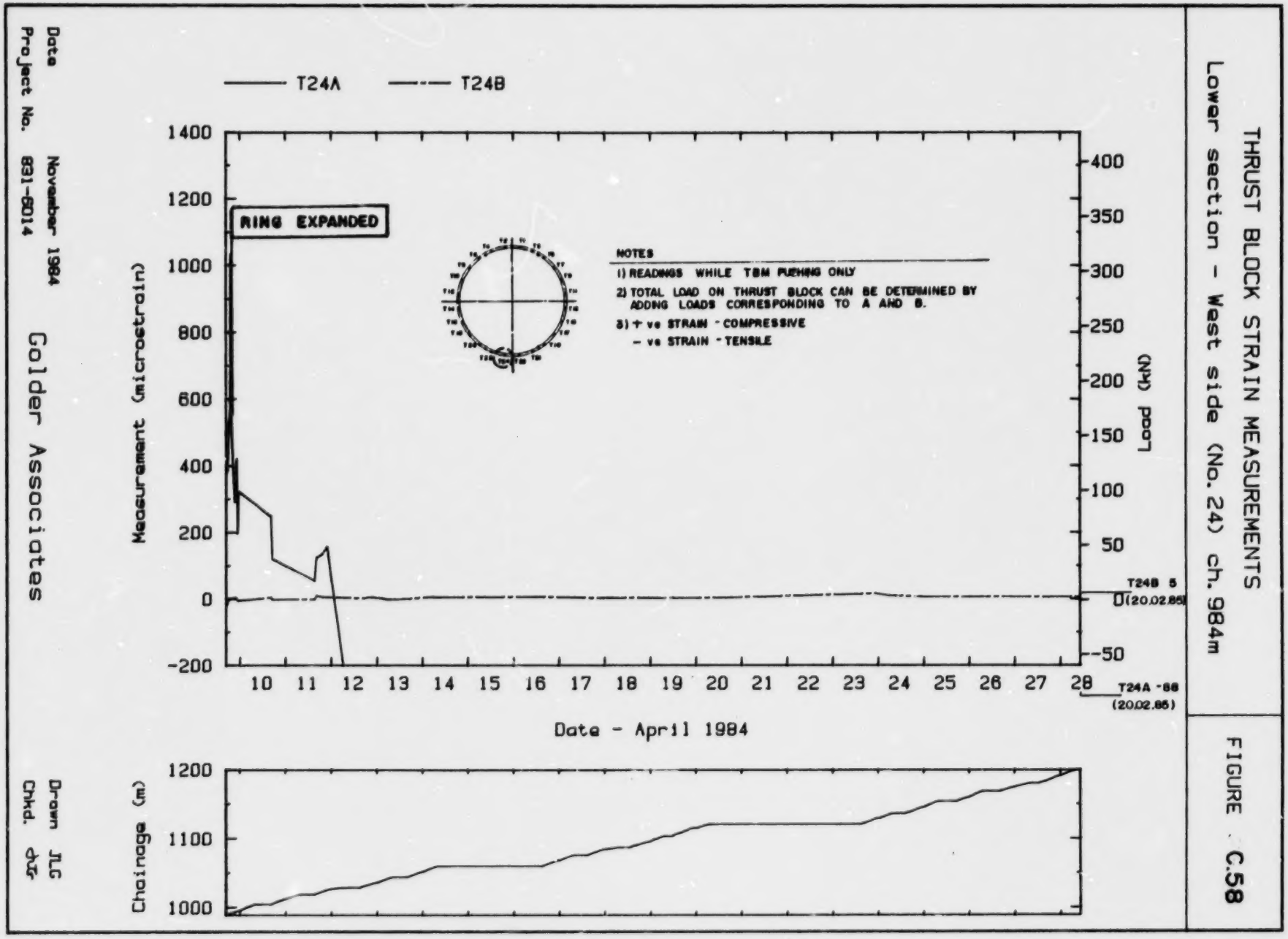
Date November 1984

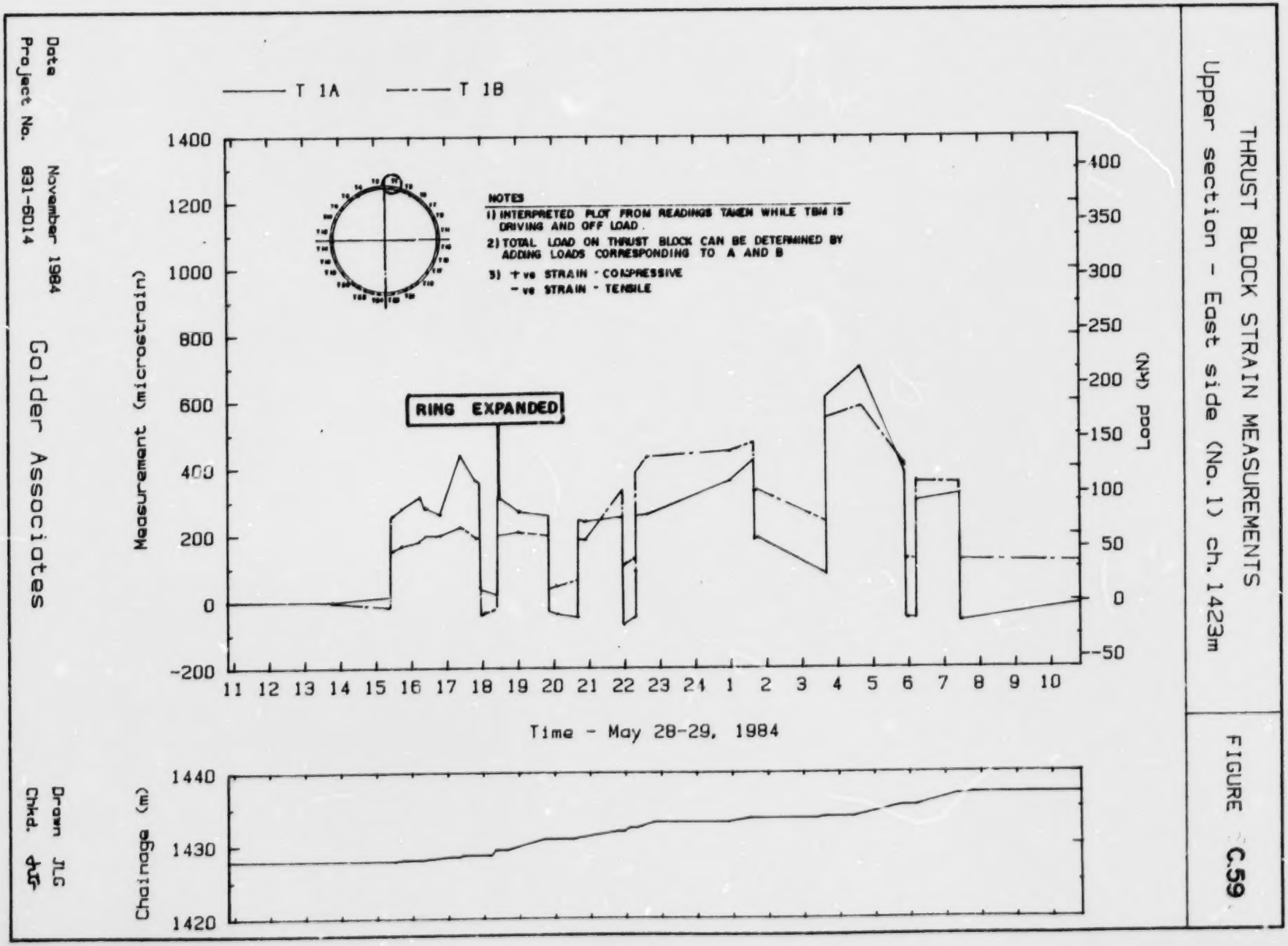
Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dp


THRUST BLOCK STRAIN MEASUREMENTS
Lower section - West side (No. 24) ch. 984m
FIGURE C.58
T24A
T24B
RING EXPANDED
NOTES
1) READINGS WHILE TBM PUSHING ONLY
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B.
3) + ve STRAIN - COMPRESSIVE
- ve STRAIN - TENSILE
Measurement (microstrain)
Load (MN)
1400
1200
1000
800
600
400
200
0
-200
400
350
300
250
200
150
100
50
0
-50
T24B 5
(20.02.85)
T24A -88
(20.02.85)
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
Date - April 1984
Chainage (m)
1200
1100
1000
Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd. CJS



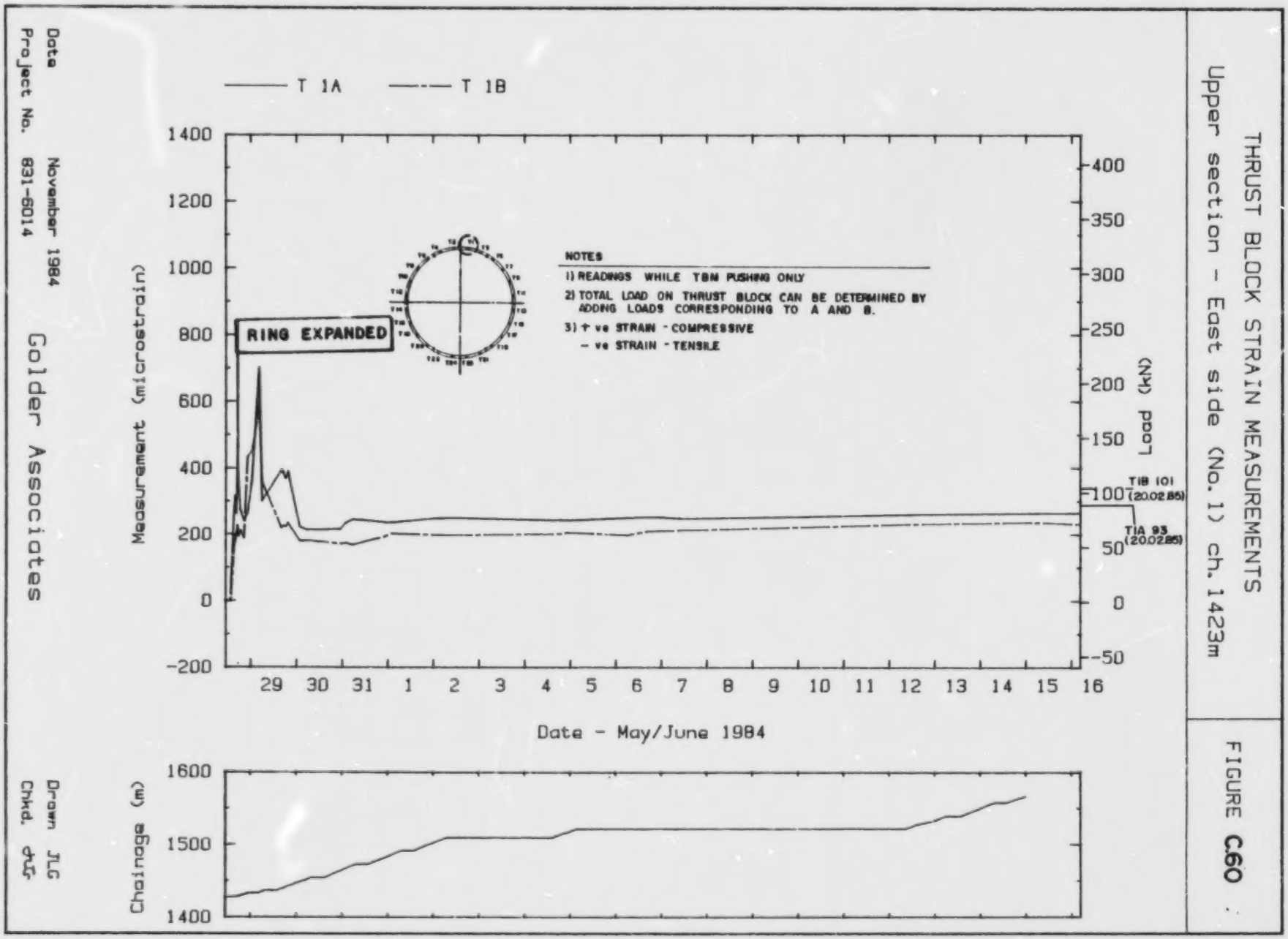
Date November 1984
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd. dcf

THRUST BLOCK STRAIN MEASUREMENTS
Upper section - East side (No. 1) ch. 1423m

FIGURE C.59



THRUST BLOCK STRAIN MEASUREMENTS

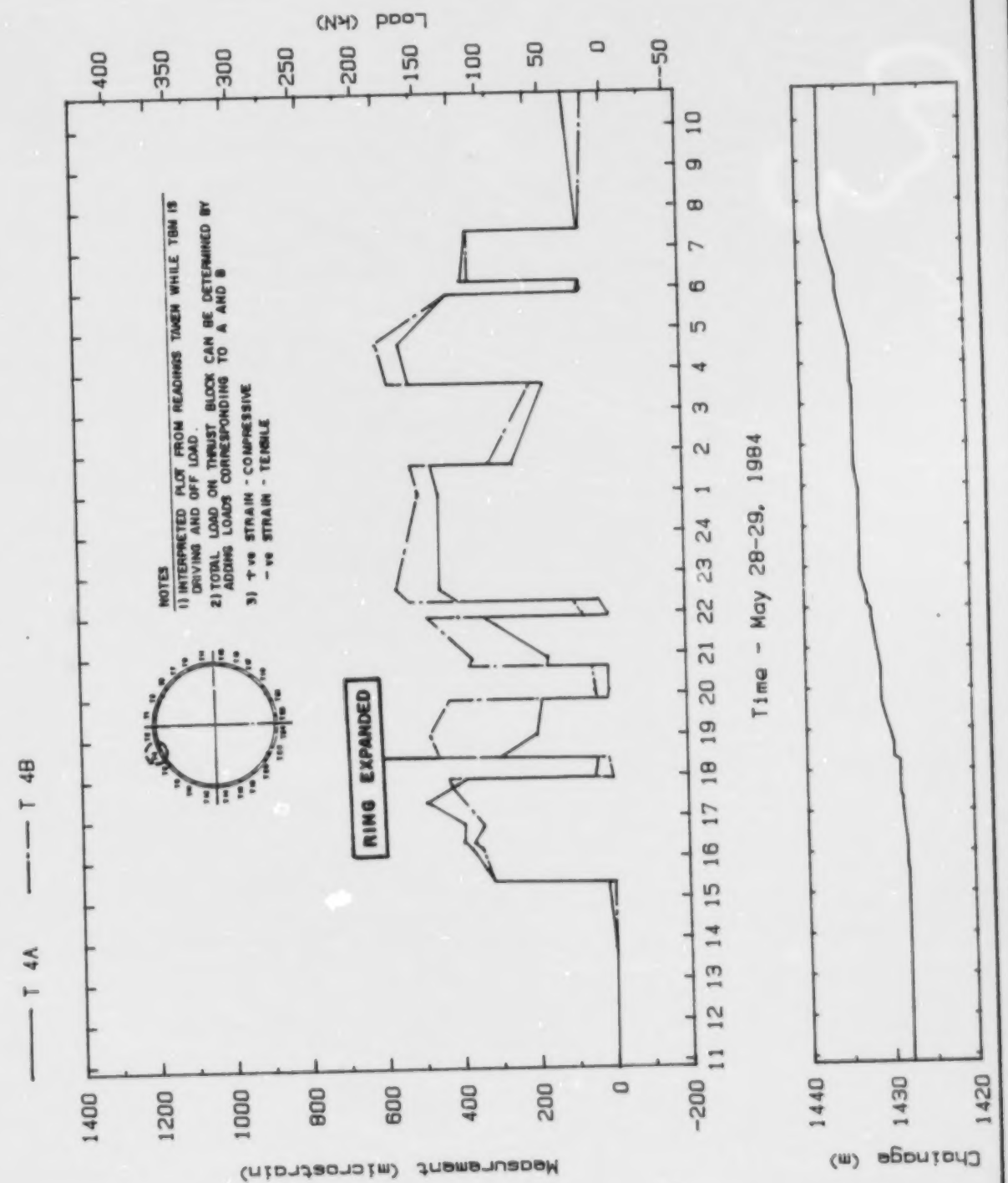
Upper section - East side (No. 1) ch. 1423m

FIGURE C.60

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 4) ch. 1423m

FIGURE C.61



Date November 1984

Project No. 831-6014

Golder Associates

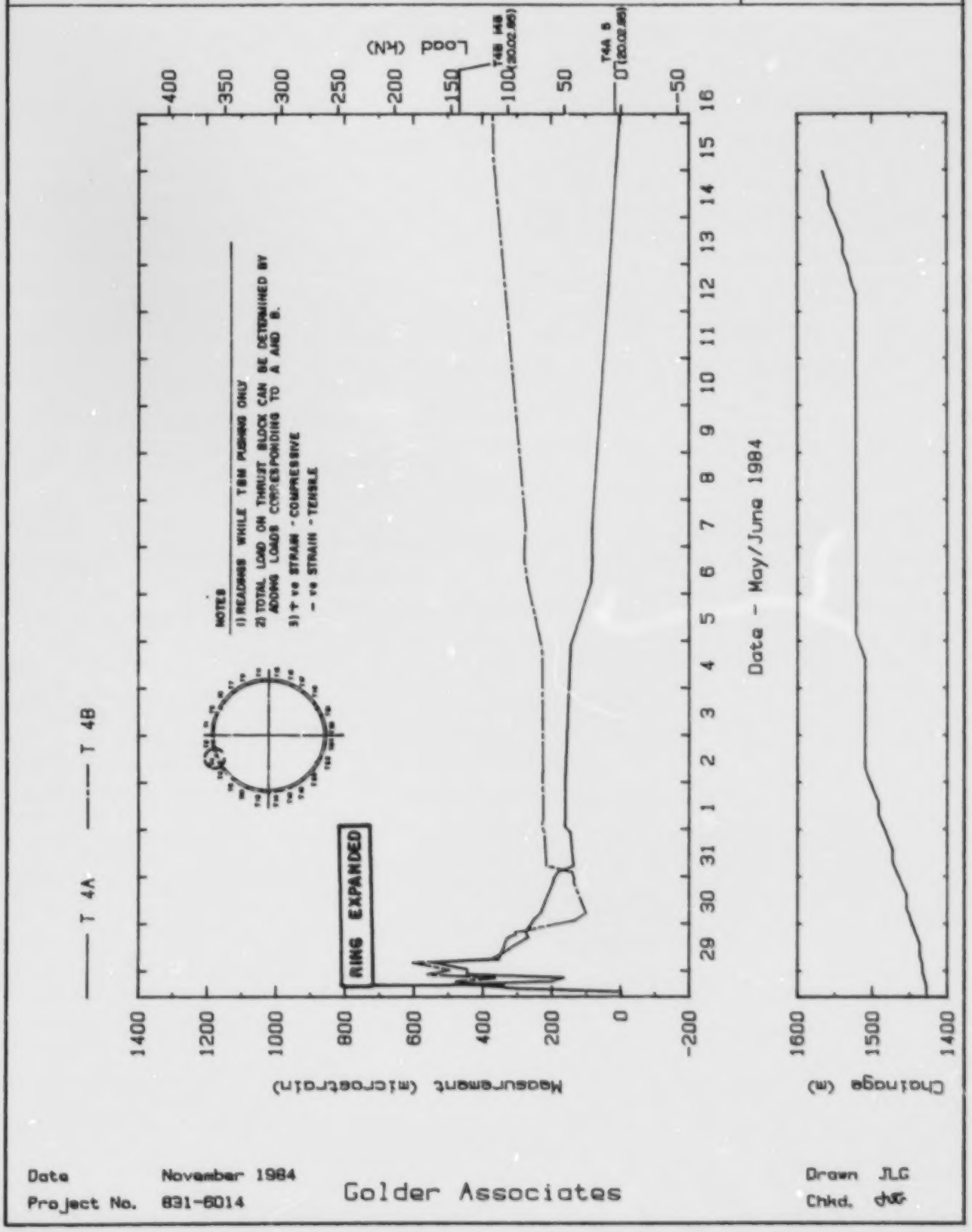
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 4) ch. 1423m

FIGURE C.62



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dwg

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 5) ch. 1423m

FIGURE C.63

Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 5) ch. 1423m

FIGURE C.64

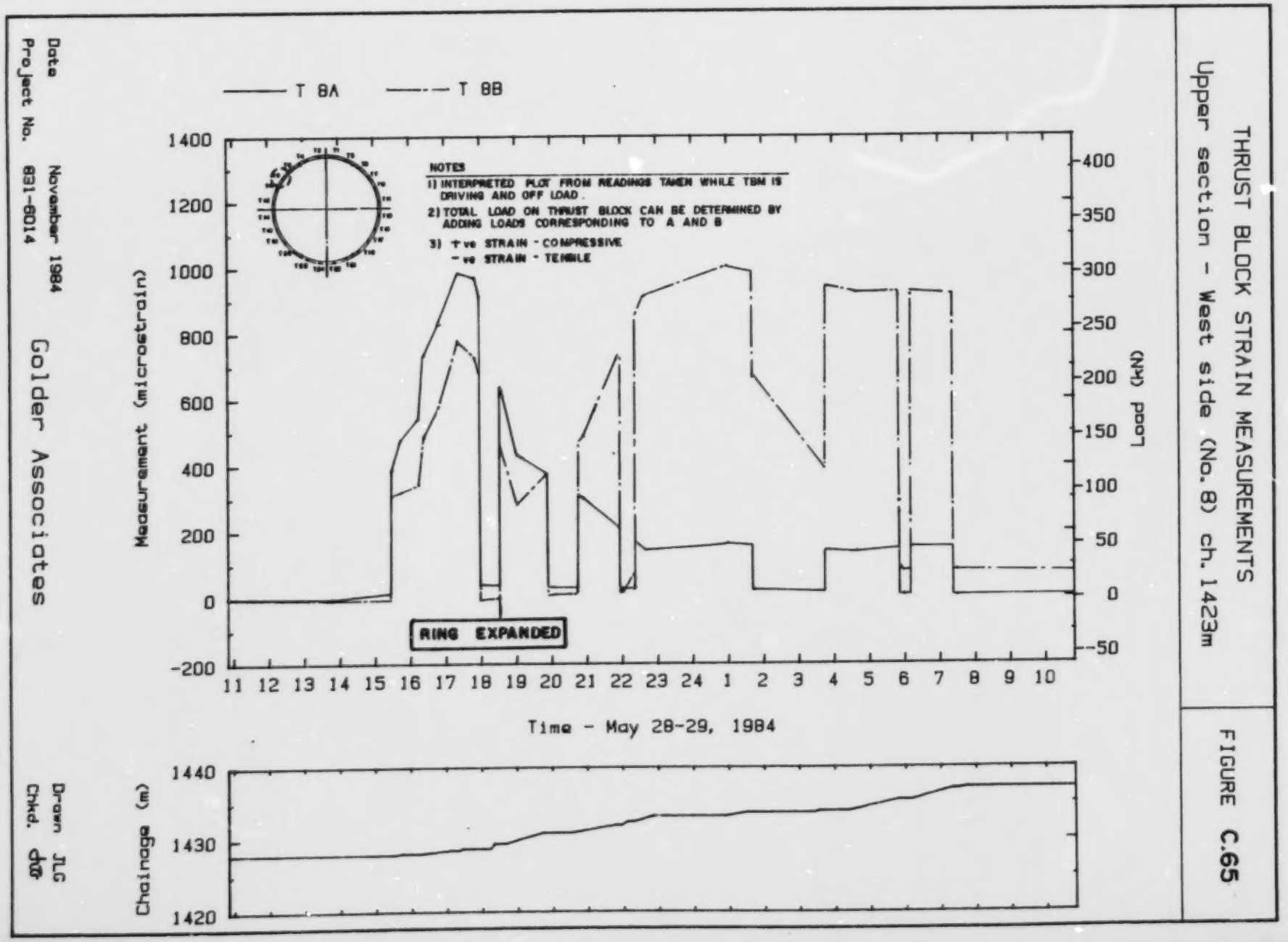
Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

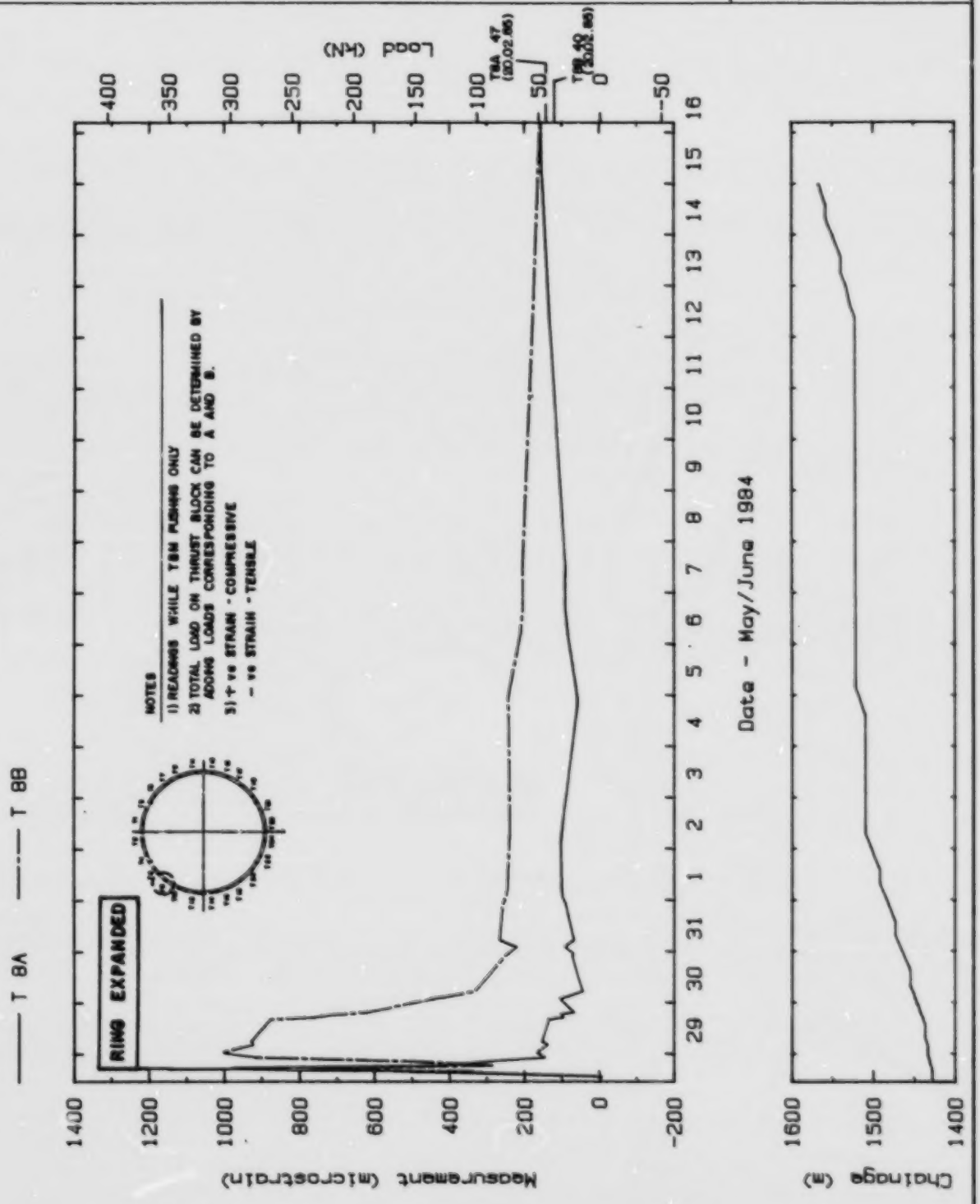
Chkd. JJF


THRUST BLOCK STRAIN MEASUREMENTS
Upper section - West side (No. 8) ch. 1423m
FIGURE C.65
T 8A
T 8B
NOTES
1) INTERPRETED PLOT FROM READINGS TAKEN WHILE TBM IS DRIVING AND OFF LOAD.
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B
3) +ve STRAIN - COMPRESSIVE
-ve STRAIN - TENSILE
Measurement (microstrain)
Load (kN)
RING EXPANDED
Time - May 28-29, 1984
Chainage (m)
Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd. dlp

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 8) ch. 1423m

FIGURE C.66



Date November 1984

Project No. 831-6014

Golder Associates

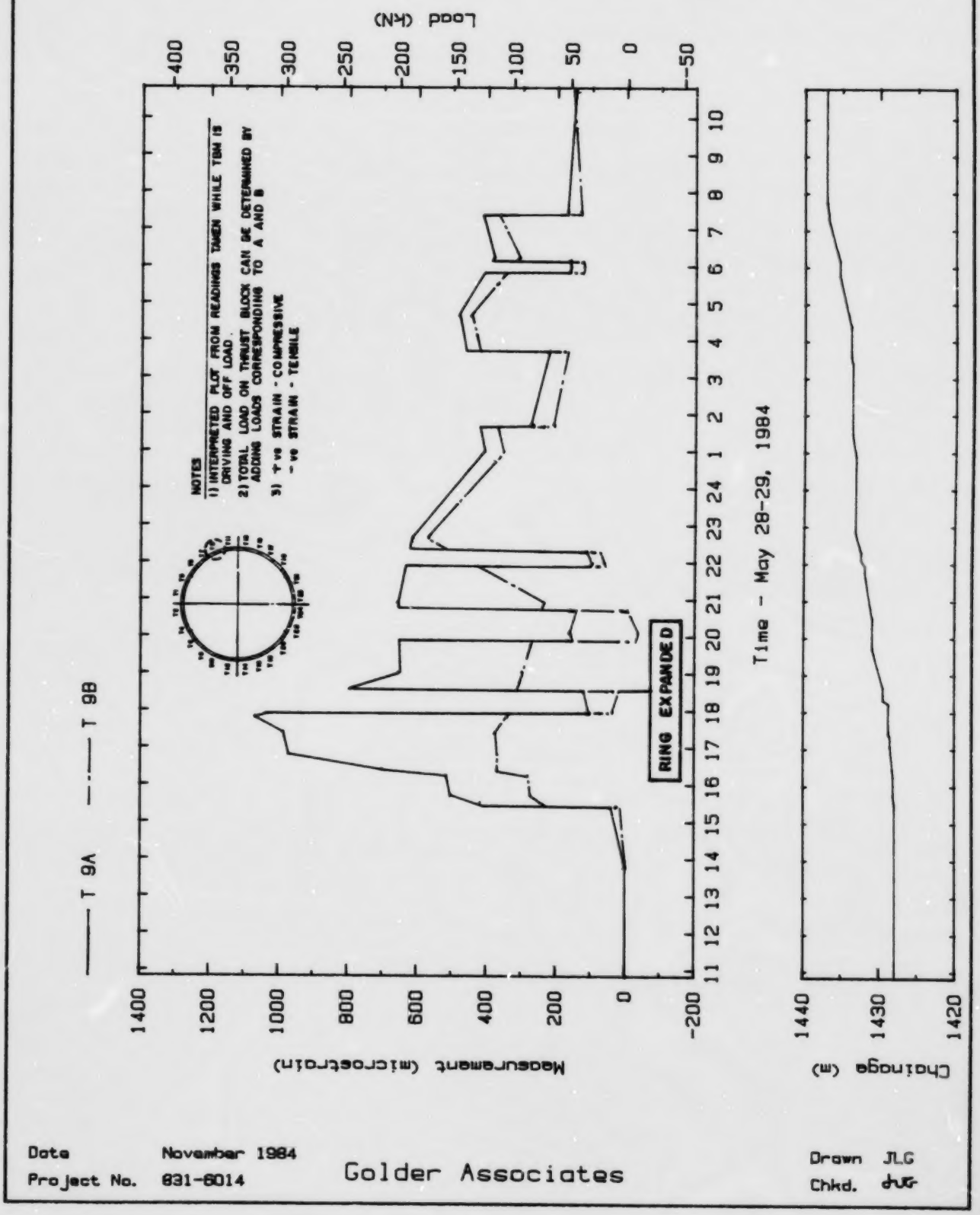
Drawn JLG

Chkd. dJG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 9) ch. 1423m

FIGURE C.67



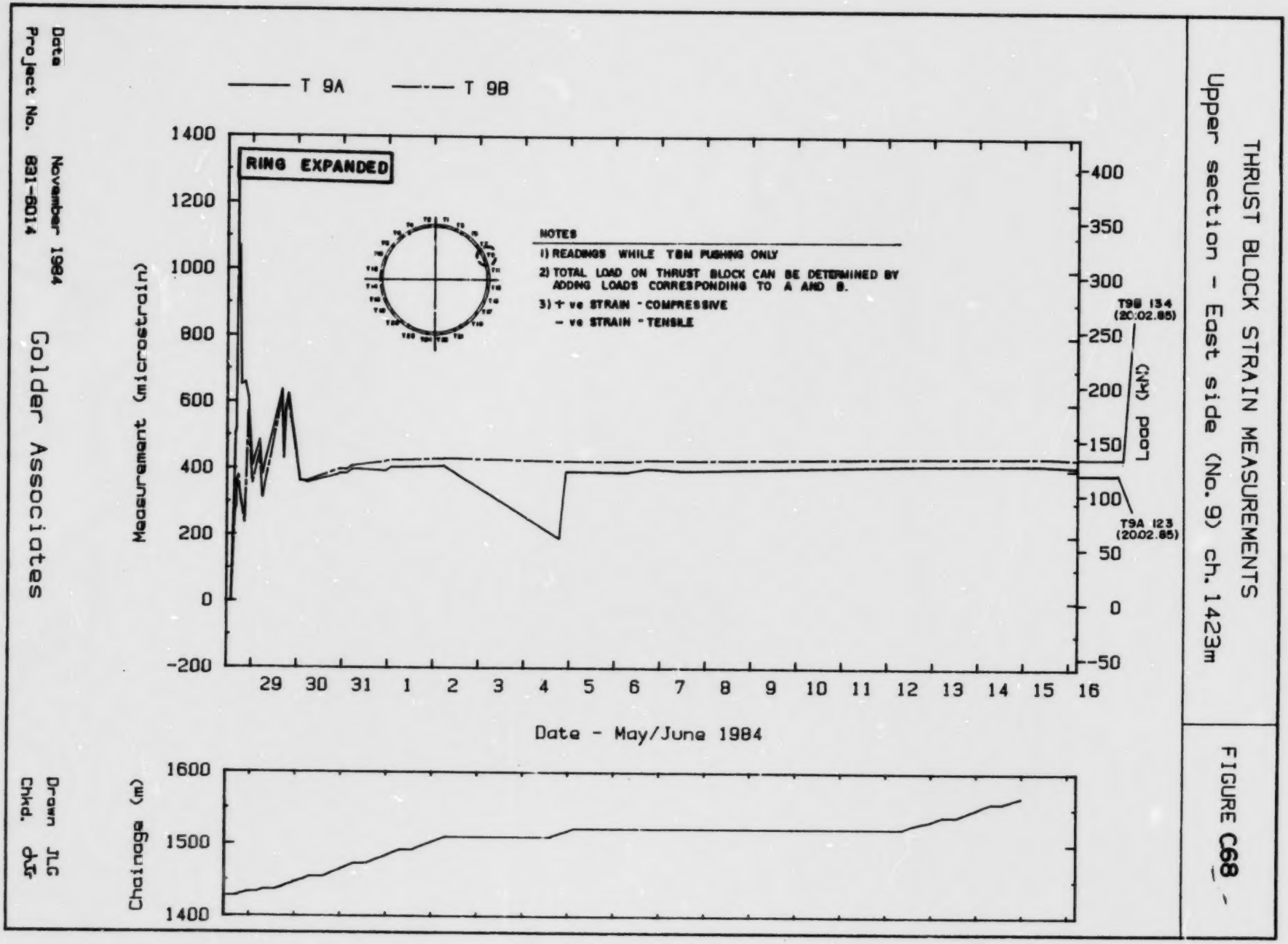
Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dvr


THRUST BLOCK STRAIN MEASUREMENTS
Upper section - East side (No. 9) ch. 1423m
FIGURE C68
Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd.
T 9A
T 9B
RING EXPANDED
NOTES
1) READINGS WHILE TBM PUSHING ONLY
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B.
3) + ve STRAIN - COMPRESSIVE
- ve STRAIN - TENSILE
Measurement (microstrain)
Load (kN)
T9B 134 (20.02.85)
T9A 123 (20.02.85)
Date - May/June 1984
Chainage (m)

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 12) ch. 1423m

FIGURE C.69

Date November 1984

Project No. 831-6014

Golder Associates

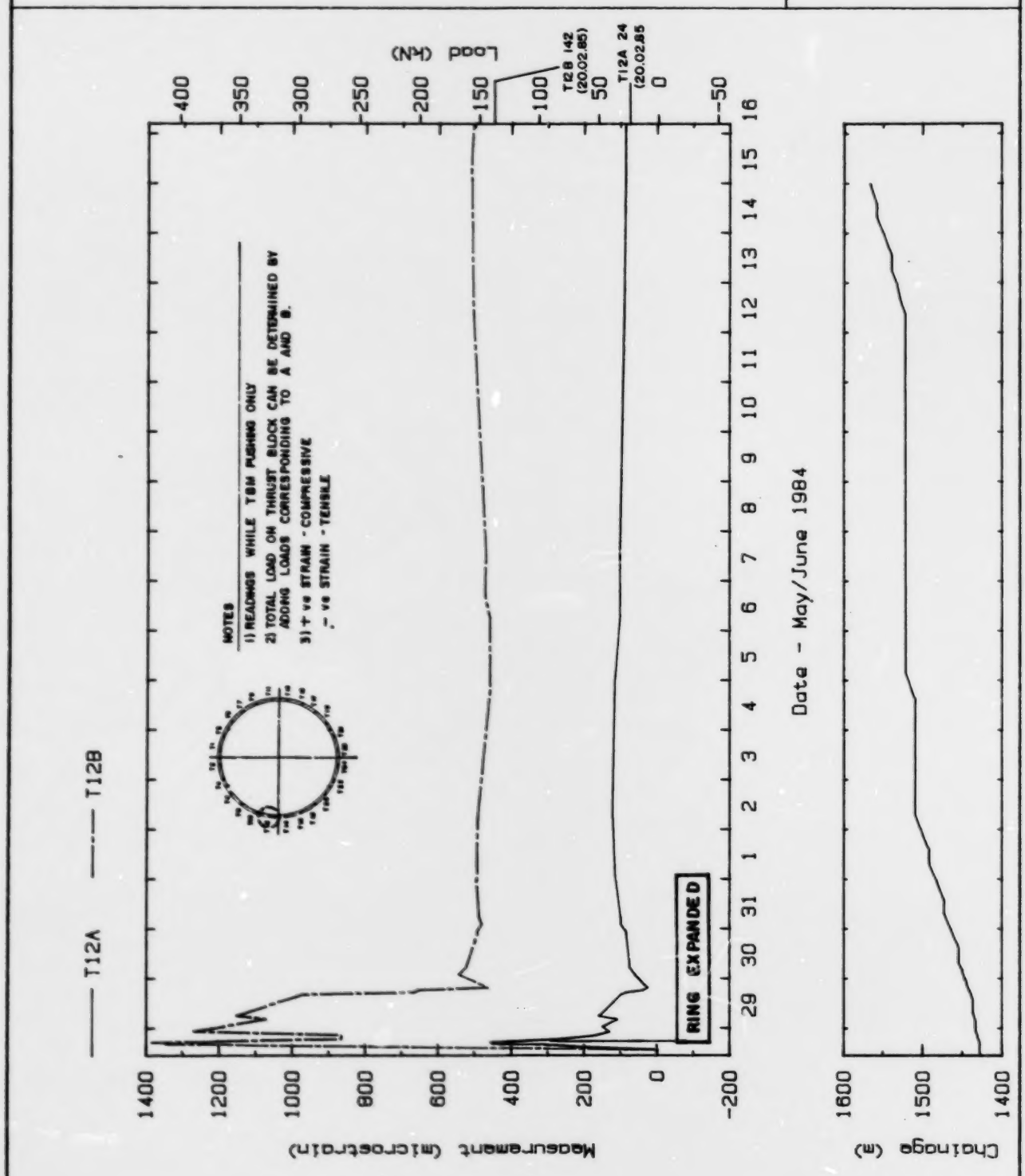
Drawn JLG

Chkd. dJG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 12) ch. 1423m

FIGURE C.70



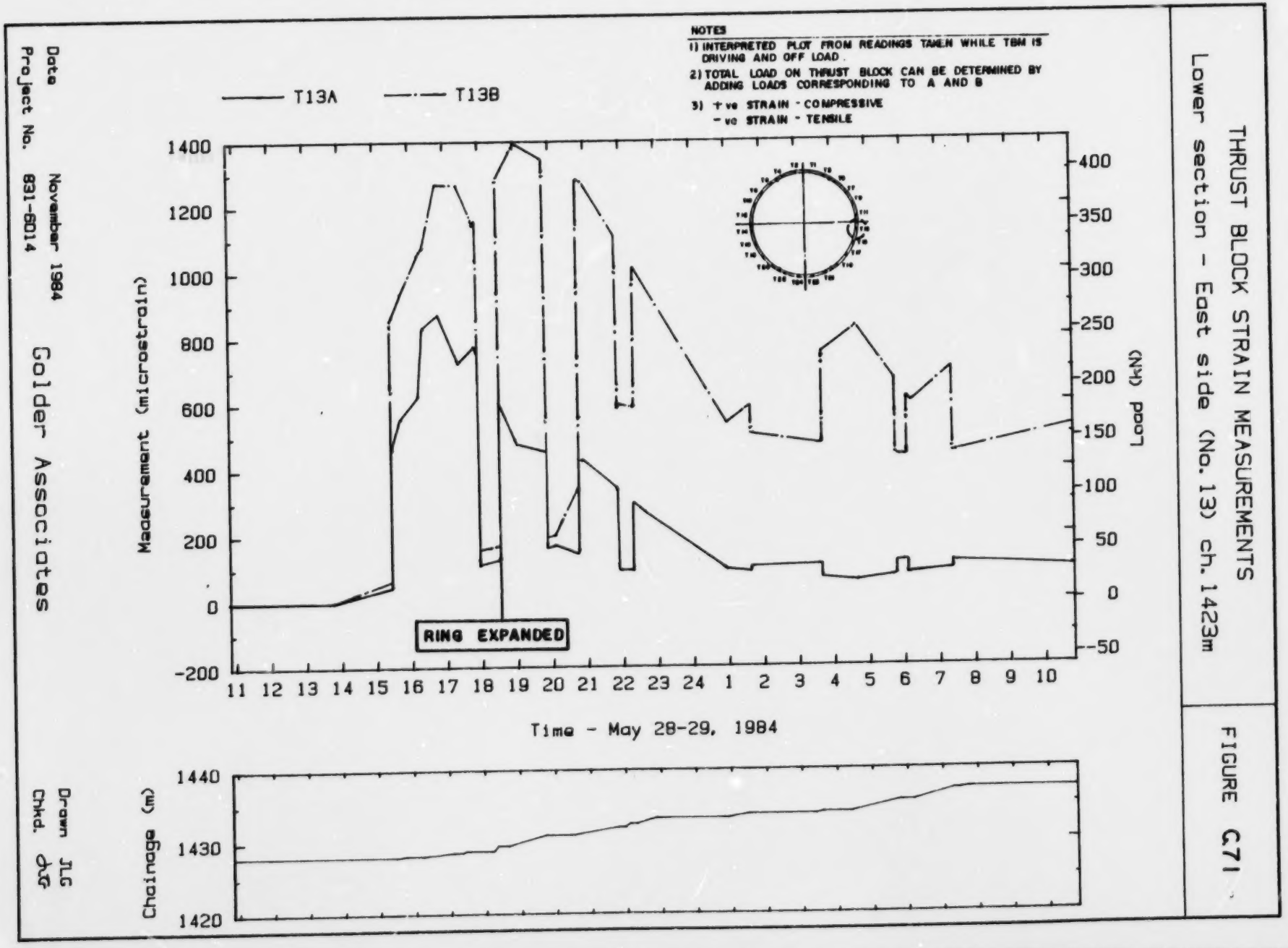
Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dtg


THRUST BLOCK STRAIN MEASUREMENTS
Lower section - East side (No. 13) ch. 1423m
FIGURE C.71
NOTES
1) INTERPRETED PLOT FROM READINGS TAKEN WHILE TBM IS DRIVING AND OFF LOAD.
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B
3) +ve STRAIN - COMPRESSIVE
-ve STRAIN - TENSILE
T13A
T13B
Measurement (microstrain)
Load (kN)
RING EXPANDED
Time - May 28-29, 1984
Chainage (m)
Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd. DJG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 13) ch. 1423m

FIGURE C.72

T13A
T13B
Load (kN)
T13 @ 295 (20.02.85)
T13A 48 (20.02.85)
NOTES
1) READINGS WHILE TBM PUSHING ONLY
2) TOTAL LOAD ON THRUST BLOCK CAN BE JETERMINED BY ADDING LOADS CORRESPONDING TO A AND B.
3) + ve STRAIN - COMPRESSIVE
- ve STRAIN - TENSILE
RING EXPANDED
Measurement (microstrain)
Date - May/June 1984
Chainage (m)

Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 16) ch. 1423m

FIGURE C.73

Date November 1984

Project No. 831-6014

Golder Associates

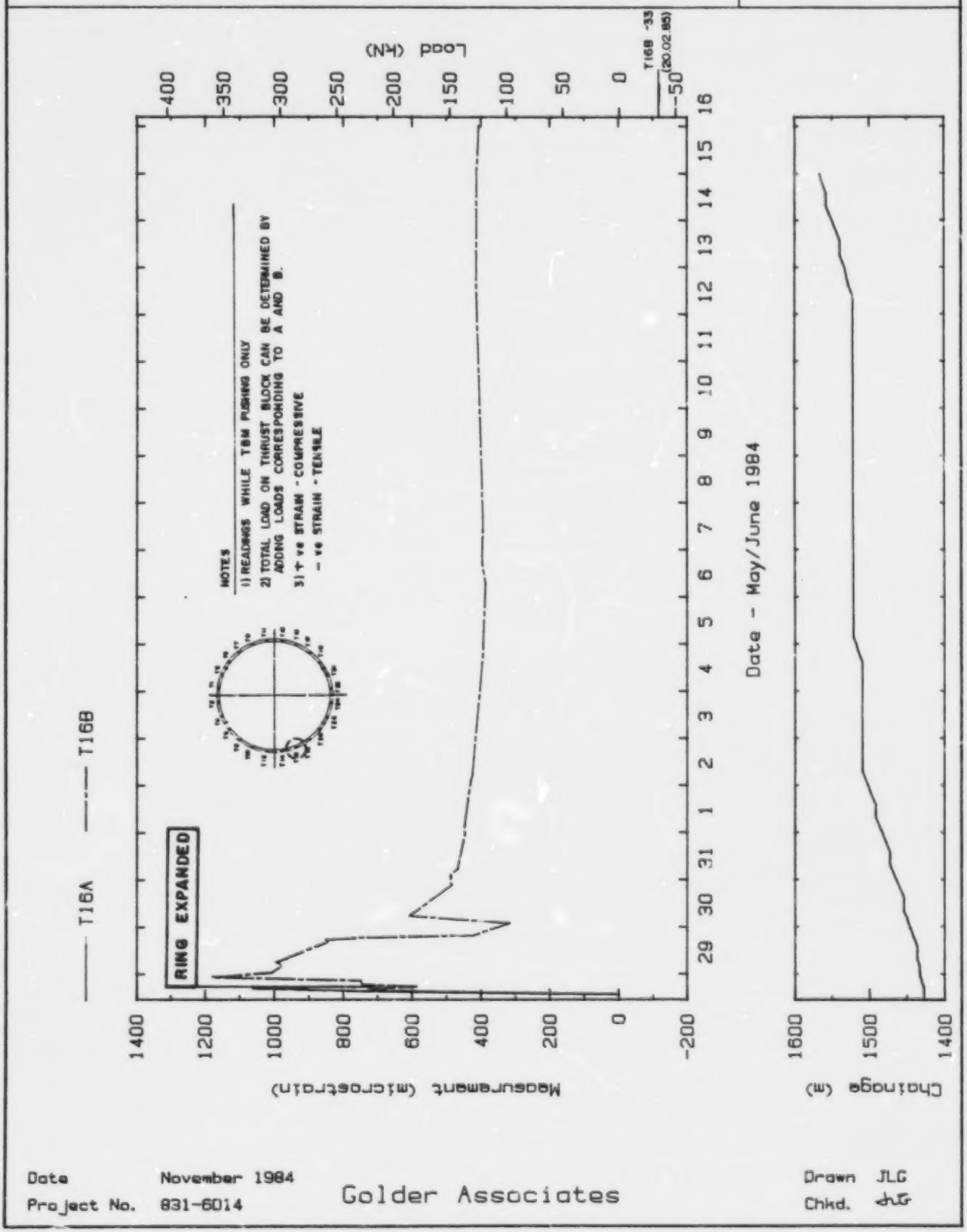
Drawn JLG

Chkd. dgp

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 16) ch. 1423m

FIGURE C.74



Date November 1984

Project No. 831-6014

Golder Associates

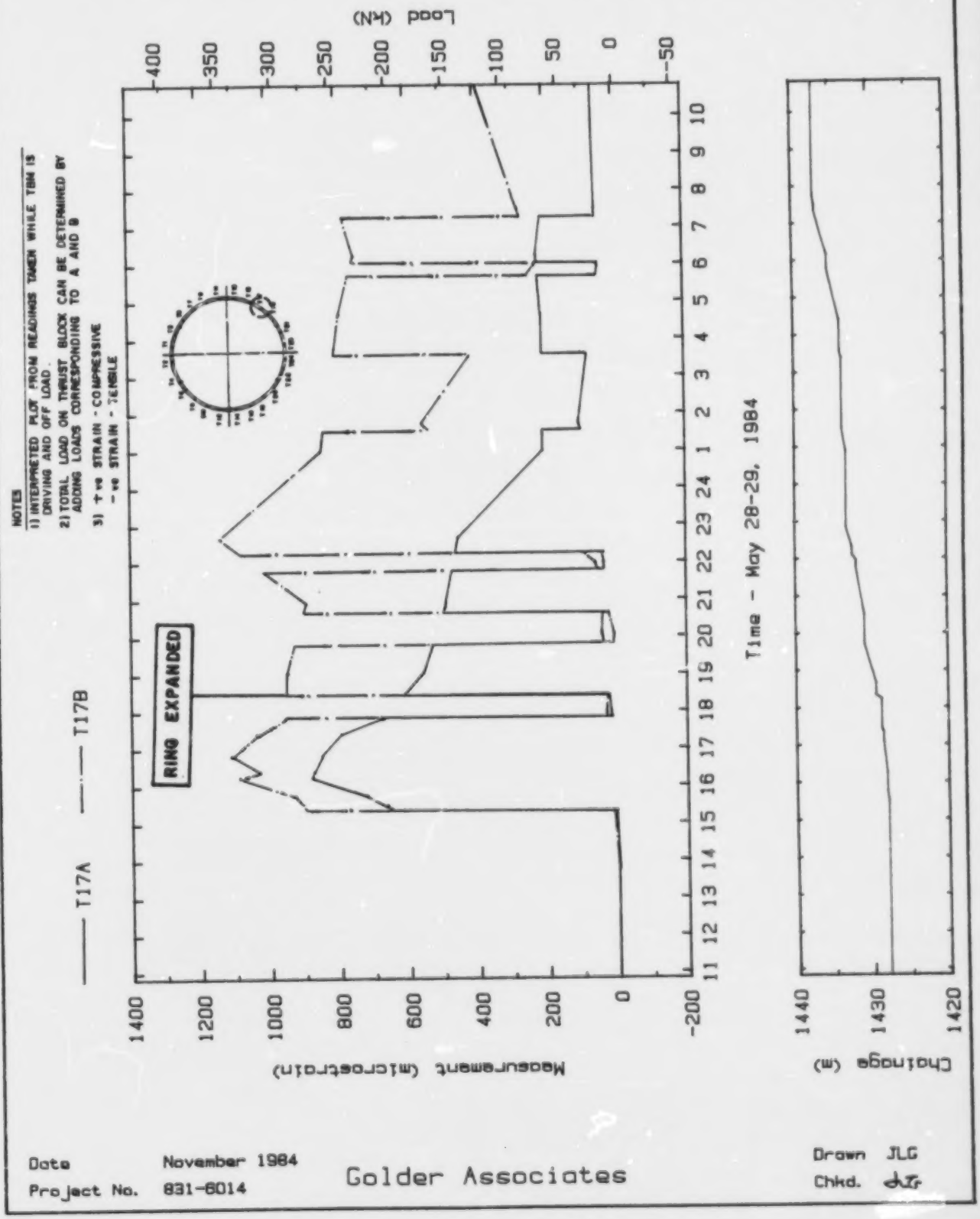
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 17) ch. 1423m

FIGURE C.75


NOTES
1) INTERPRETED PLOT FROM READINGS TAKEN WHILE TBM IS DRIVING AND OFF LOAD.
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B
3) +ve STRAIN - COMPRESSIVE
-ve STRAIN - TENSILE
T17A
T17B
RING EXPANDED
Load (KN)
400 350 300 250 200 150 100 50 0 -50
Measurement (microstrain)
1400 1200 1000 800 600 400 200 0 -200
11 12 13 14 15 16 17 18 19 20 21 22 23 24 1 2 3 4 5 6 7 8 9 10
Time - May 28-29, 1984
Chainage (m)
1440 1430 1420

Date November 1984

Project No. 831-6014

Golder Associates

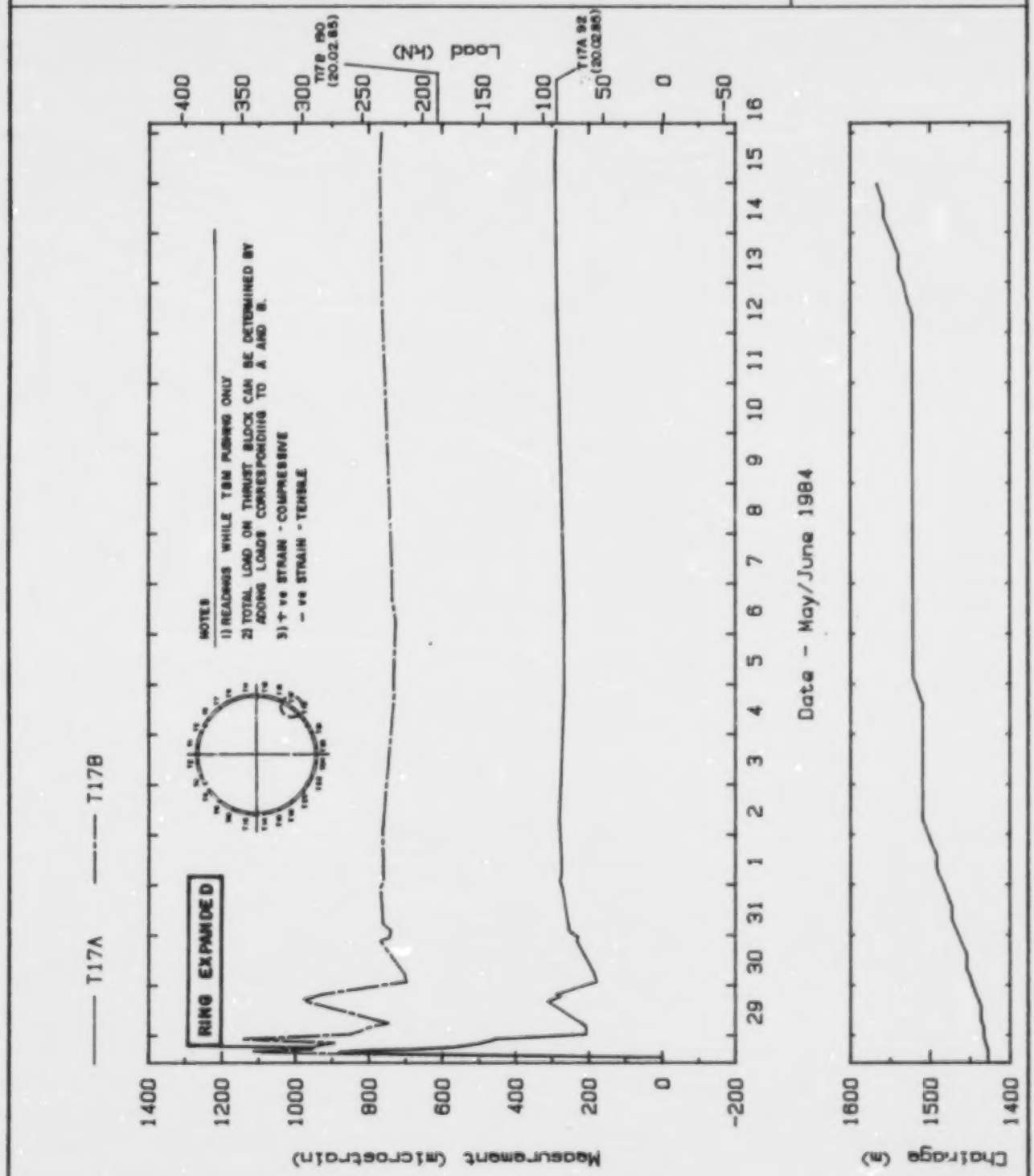
Drawn JLG

Chkd. JJF

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 17) ch. 1423m

FIGURE C.76



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLC

Chkd. JJr

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 20) ch. 1423m

FIGURE C.77

Date November 1984

Project No. 831-6014

Golder Associates

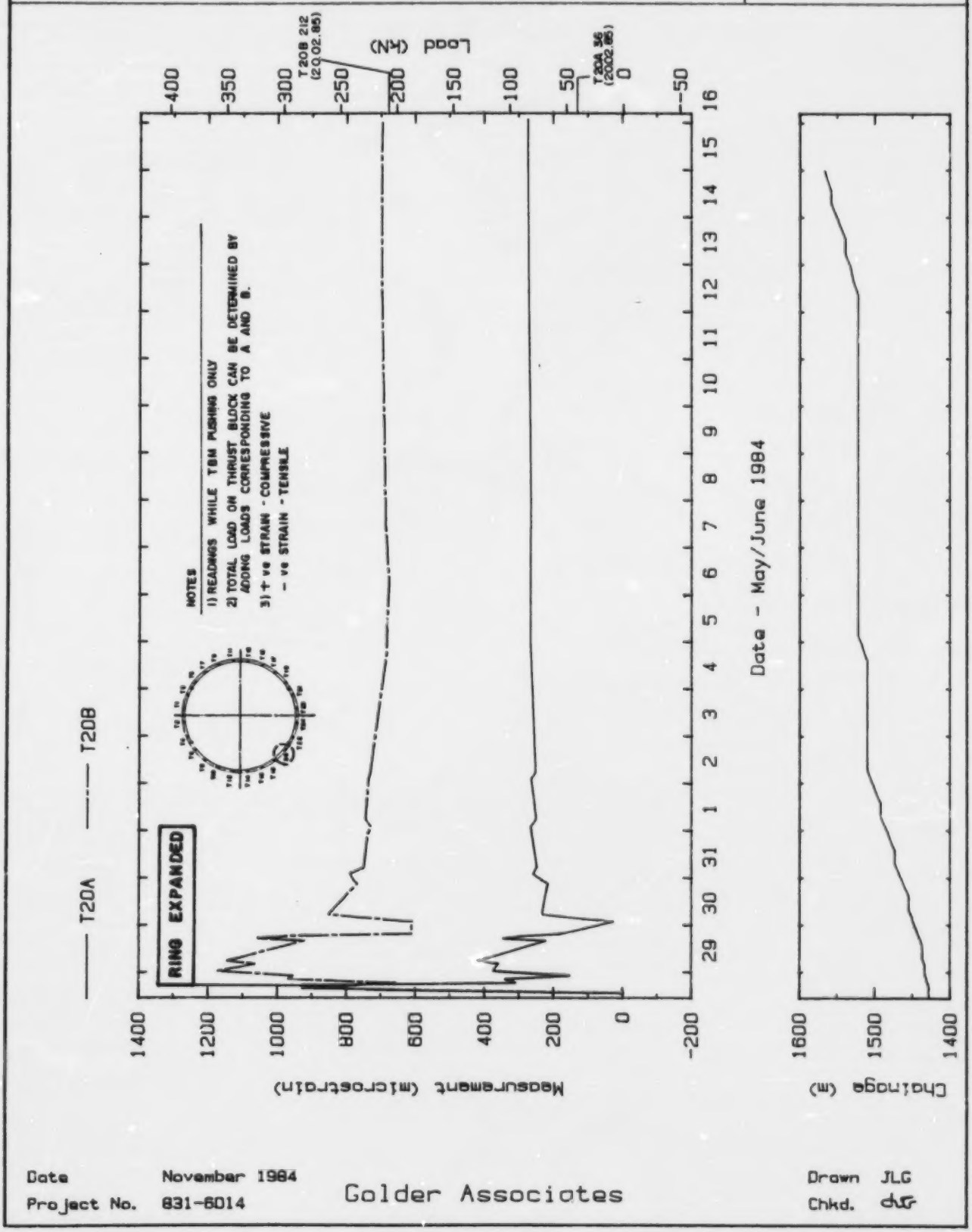
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 20) ch. 1423m

FIGURE C.78



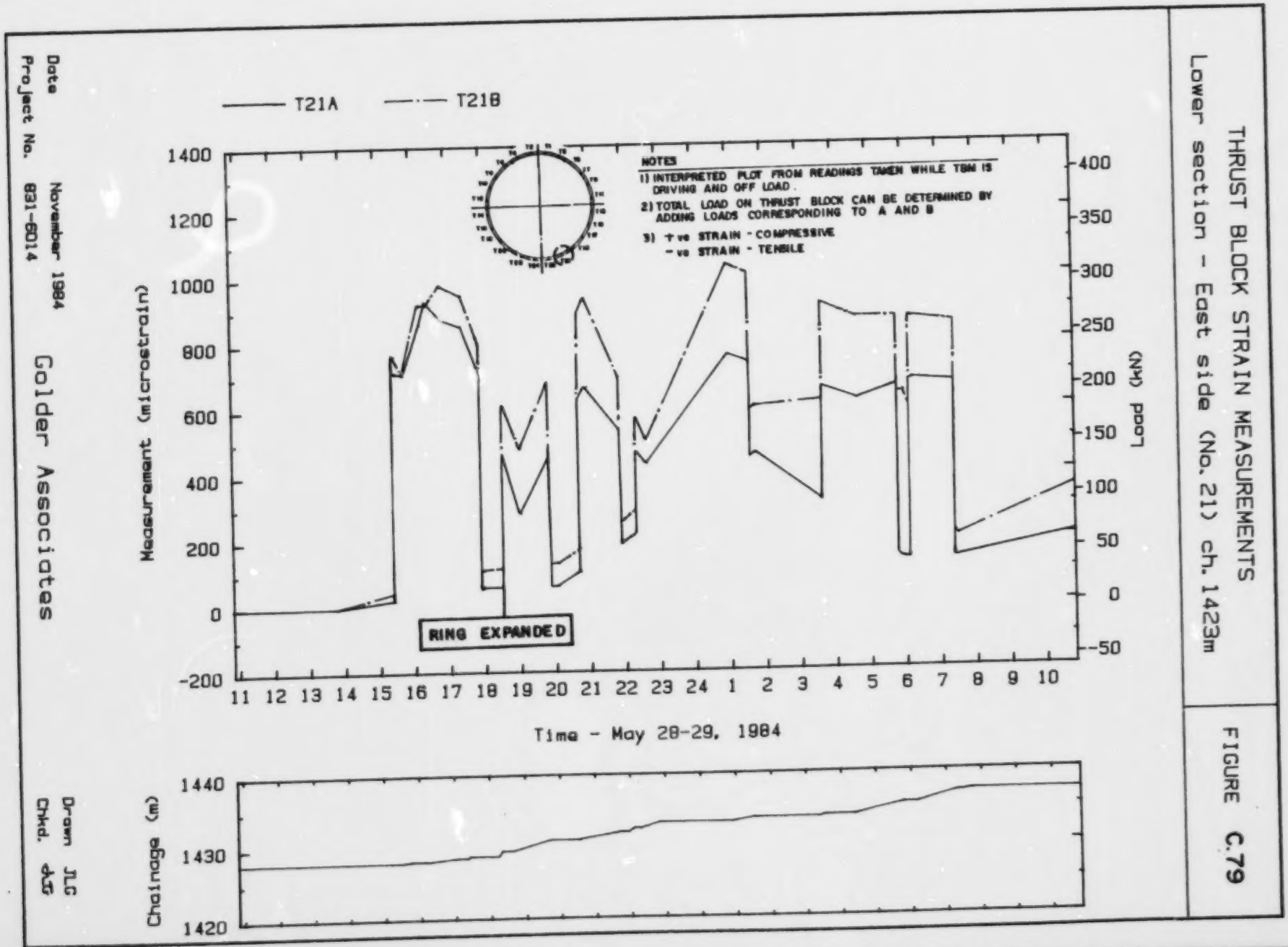
Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

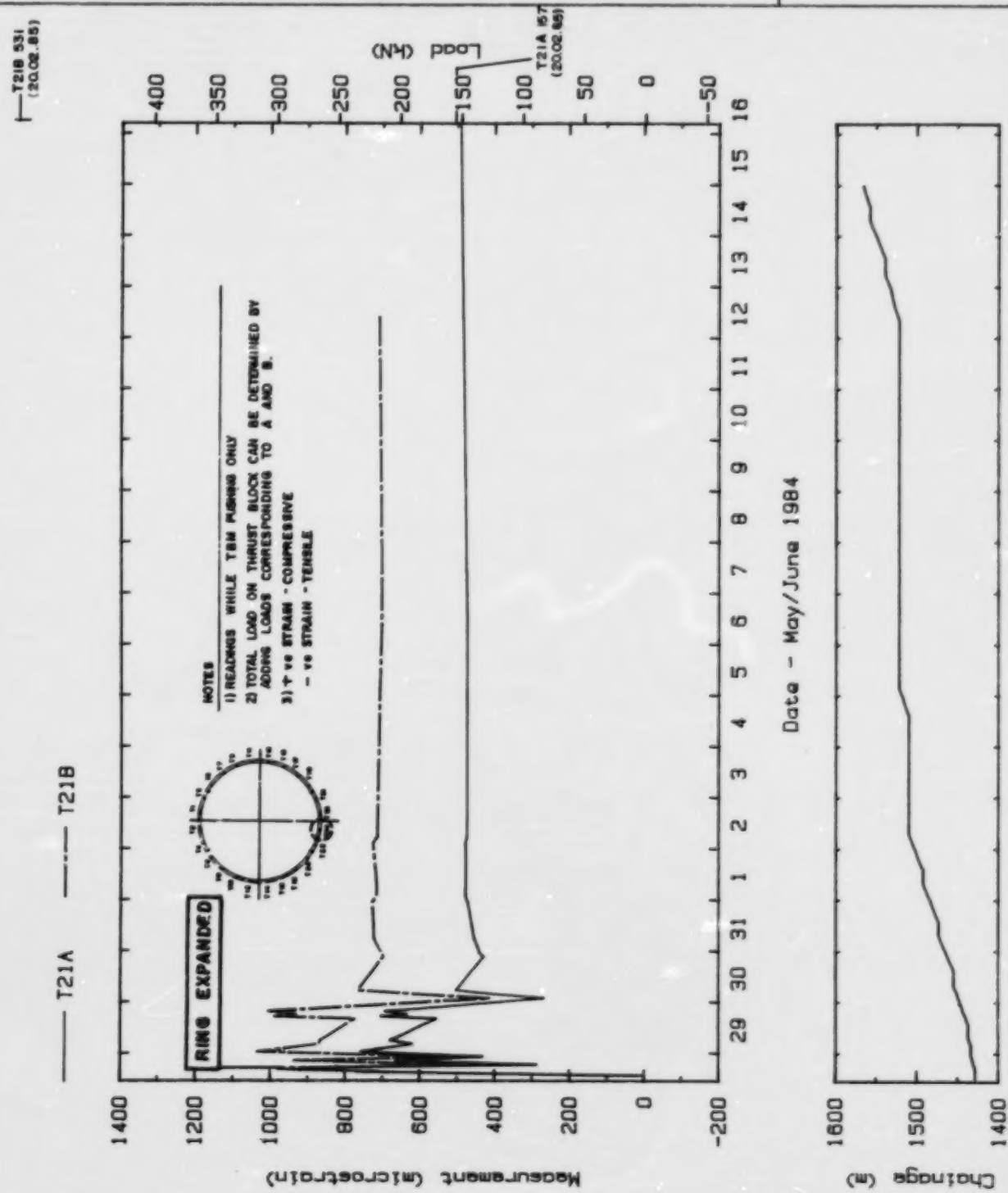
Chkd. dsp


THRUST BLOCK STRAIN MEASUREMENTS
Lower section - East side (No. 21) ch. 1423m
FIGURE C.79
T21A
T21B
NOTES
1) INTERPRETED PLOT FROM READINGS TAKEN WHILE TBM IS DRIVING AND OFF LOAD.
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B
3) +ve STRAIN - COMPRESSIVE
-ve STRAIN - TENSILE
Measurement (microstrain)
Load (MN)
RING EXPANDED
Time - May 28-29, 1984
Chainage (m)
Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd. dkg

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 21) ch. 1423m

FIGURE C.80



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLC

Chkd.

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 24) ch. 1423m

FIGURE C.81

Date November 1984

Project No. 831-2014

Golder Associates

Drawn JLG

Chkd. dgf

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 24) ch. 1423m

FIGURE C.82

Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 2) ch. 1831m

FIGURE **C.83**

Date November 1984

Project No. 831-6014

Golder Associates

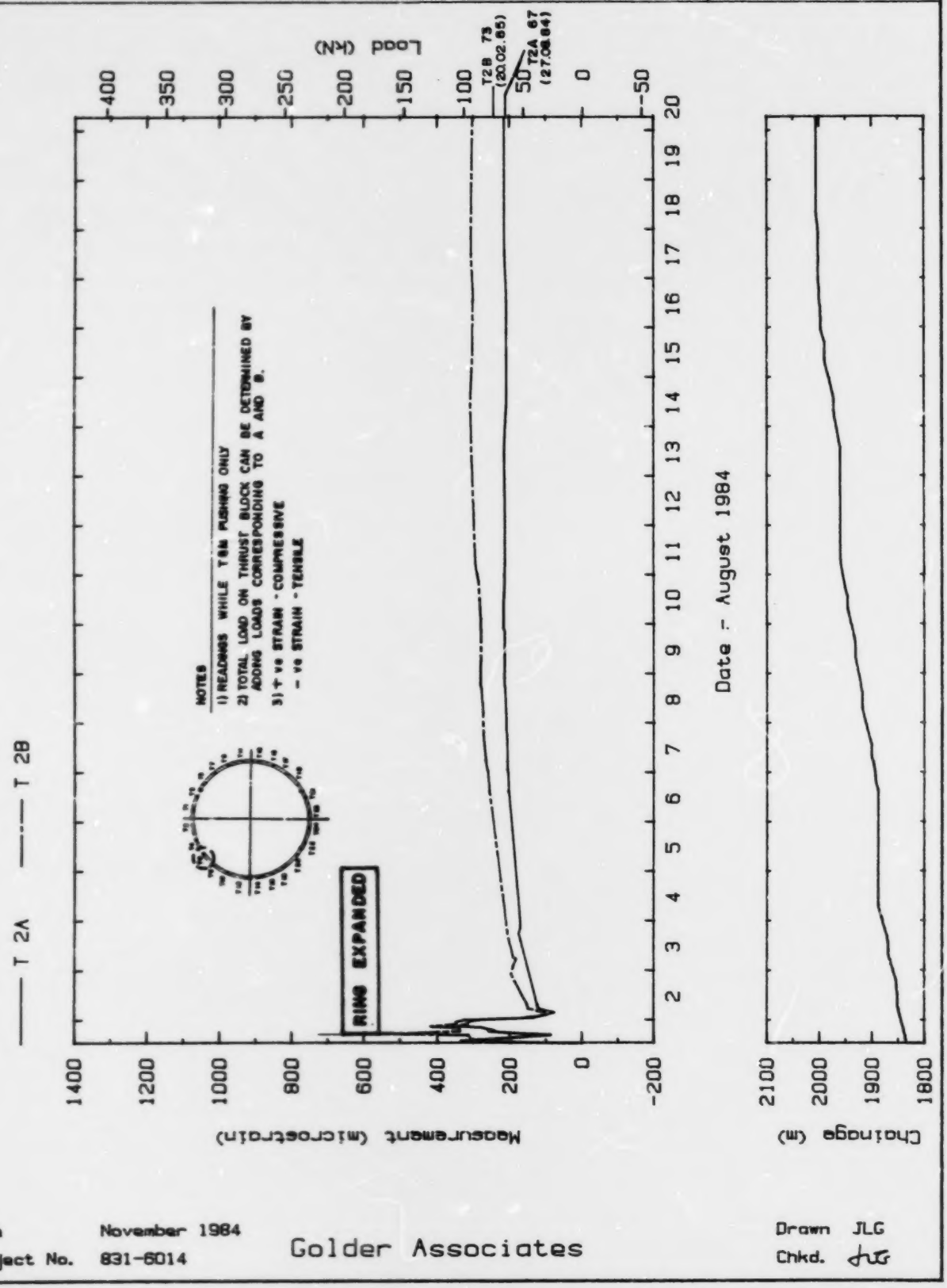
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 2) ch. 1831m

FIGURE C.84



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 6) ch. 1831m

FIGURE **C.85**

Date November 1984

Project No. 831-6014

Golder Associates

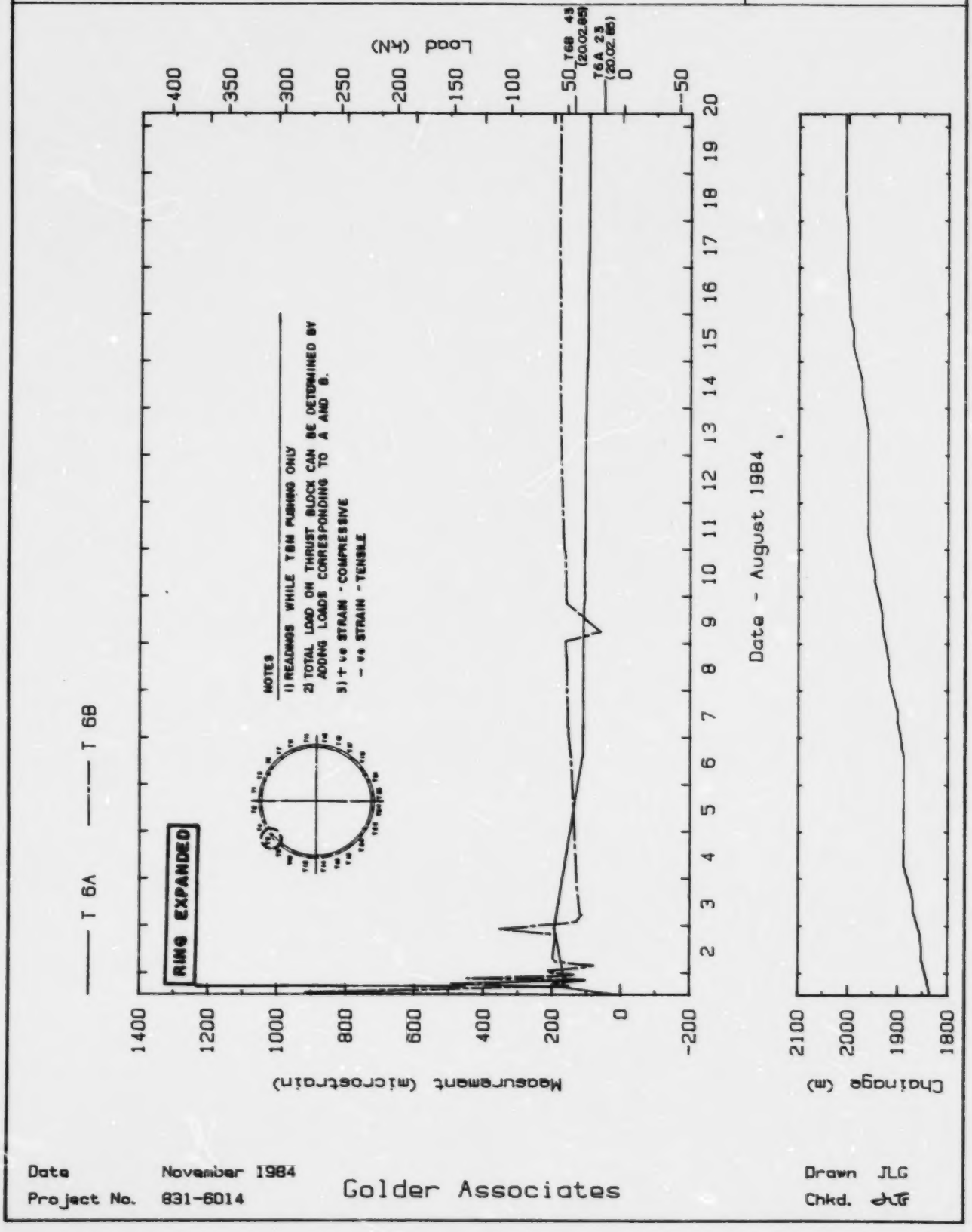
Drawn JLG

Chkd. dhr

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 6) ch. 1831m

FIGURE C.86



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLC

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 7) ch. 1831m

FIGURE **C.87**

Date November 1984

Project No. 831-6014

Golder Associates

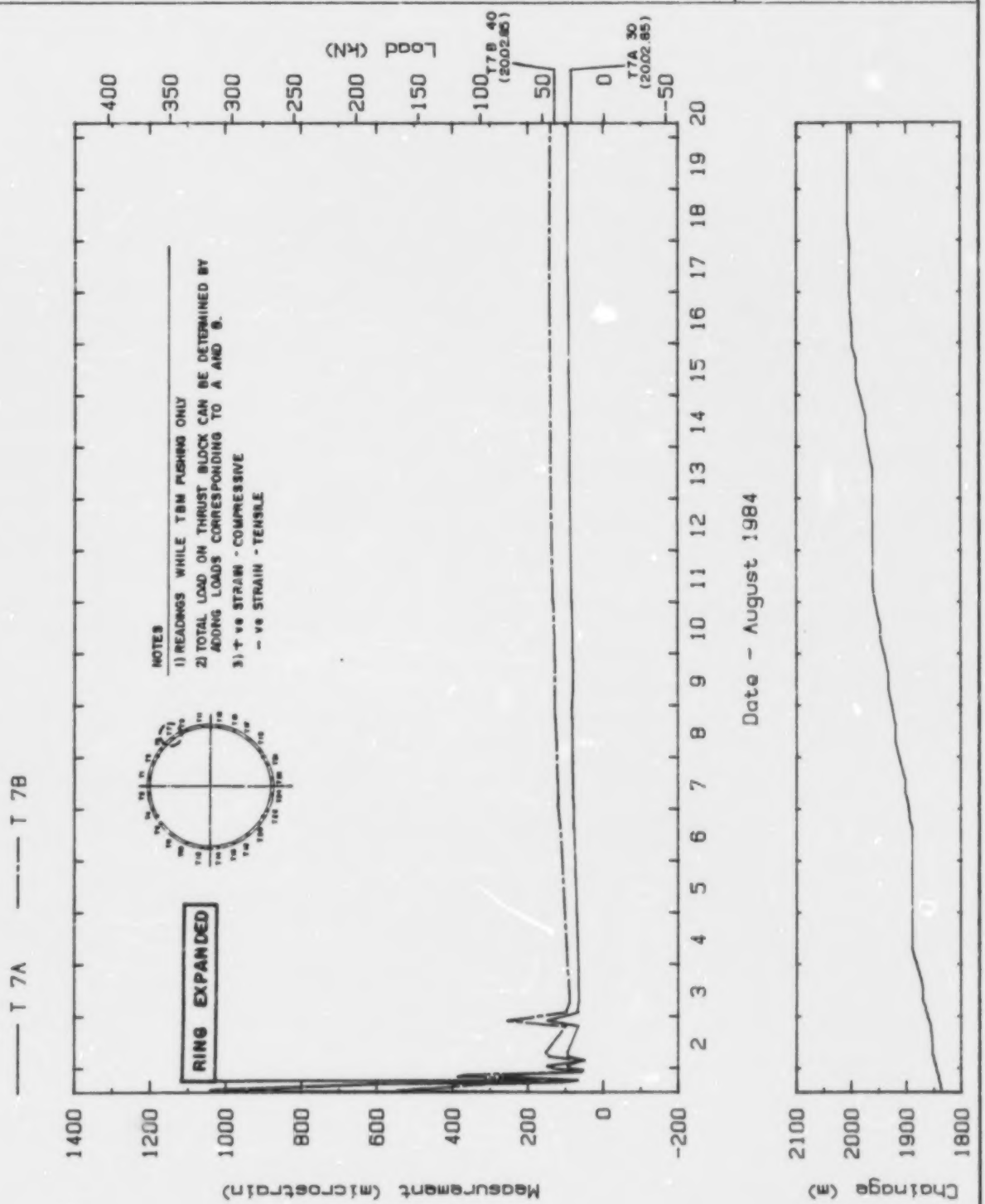
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - East side (No. 7) ch. 1831m

FIGURE C.88


Load (kN)
T7B 40 (2002 85)
T7A 30 (2002 85)
NOTES
1) READINGS WHILE TBM PUSHING ONLY
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B.
3) + ve STRAIN - COMPRESSIVE
- ve STRAIN - TENSILE
RING EXPANDED
T 7A
T 7B
Measurement (microstrain)
Date - August 1984
Chainage (m)

Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dtg

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 12) ch. 1831m

FIGURE C.89

Date November 1984

Project No. 831-6014

Golder Associates

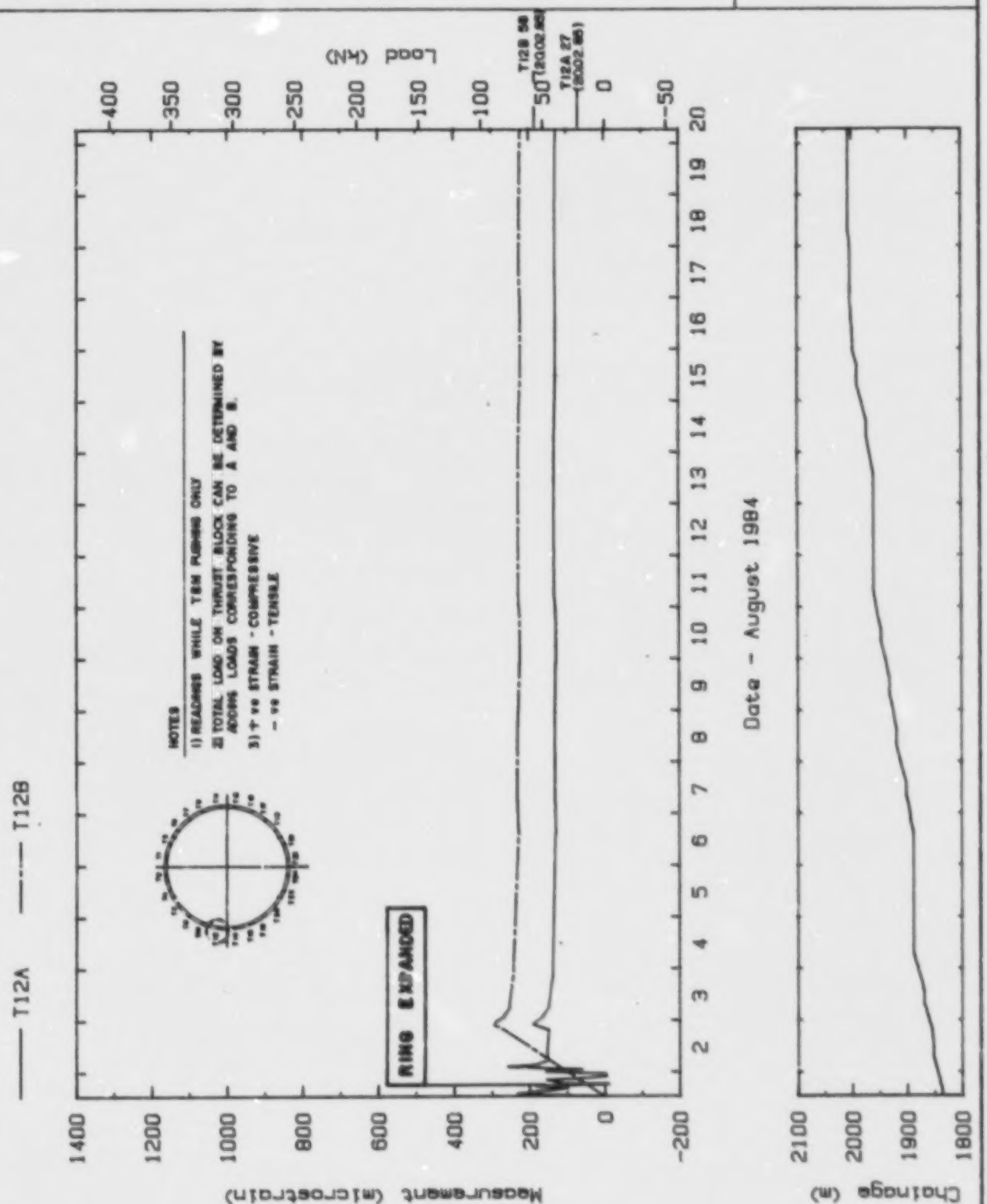
Drawn JLG

Chkd. dhG

THRUST BLOCK STRAIN MEASUREMENTS

Upper section - West side (No. 12) ch. 1831m

FIGURE C.90



Date November 1984

Project No. 831-6014

Golder Associates

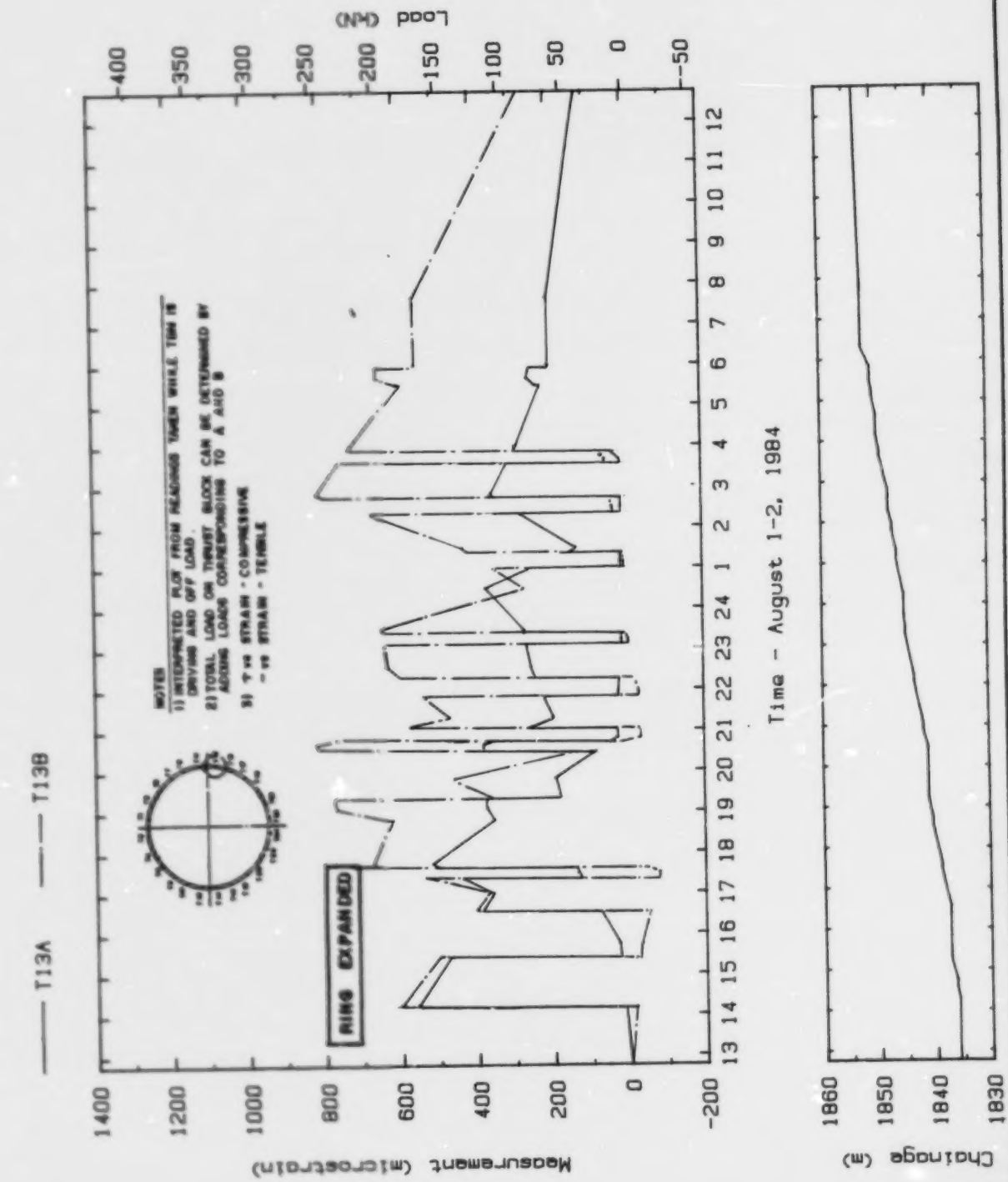
Drawn JLG

Chkd.

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 13) ch. 1831m

FIGURE C.91



Date November 1984

Project No. 831-6014

Golder Associates

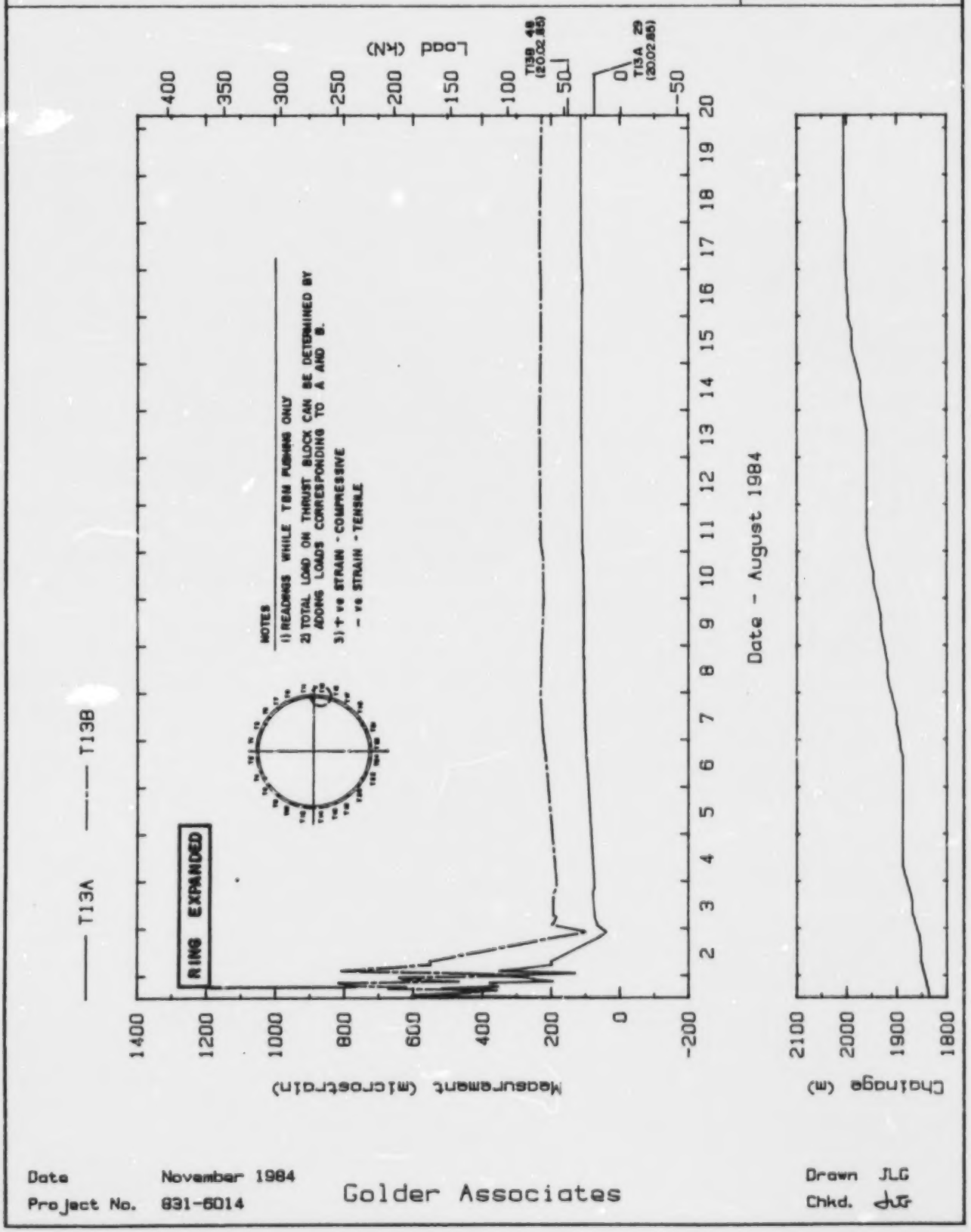
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 13) ch. 1831m

FIGURE C.92



Date November 1984

Project No. 831-6014

Golder Associates

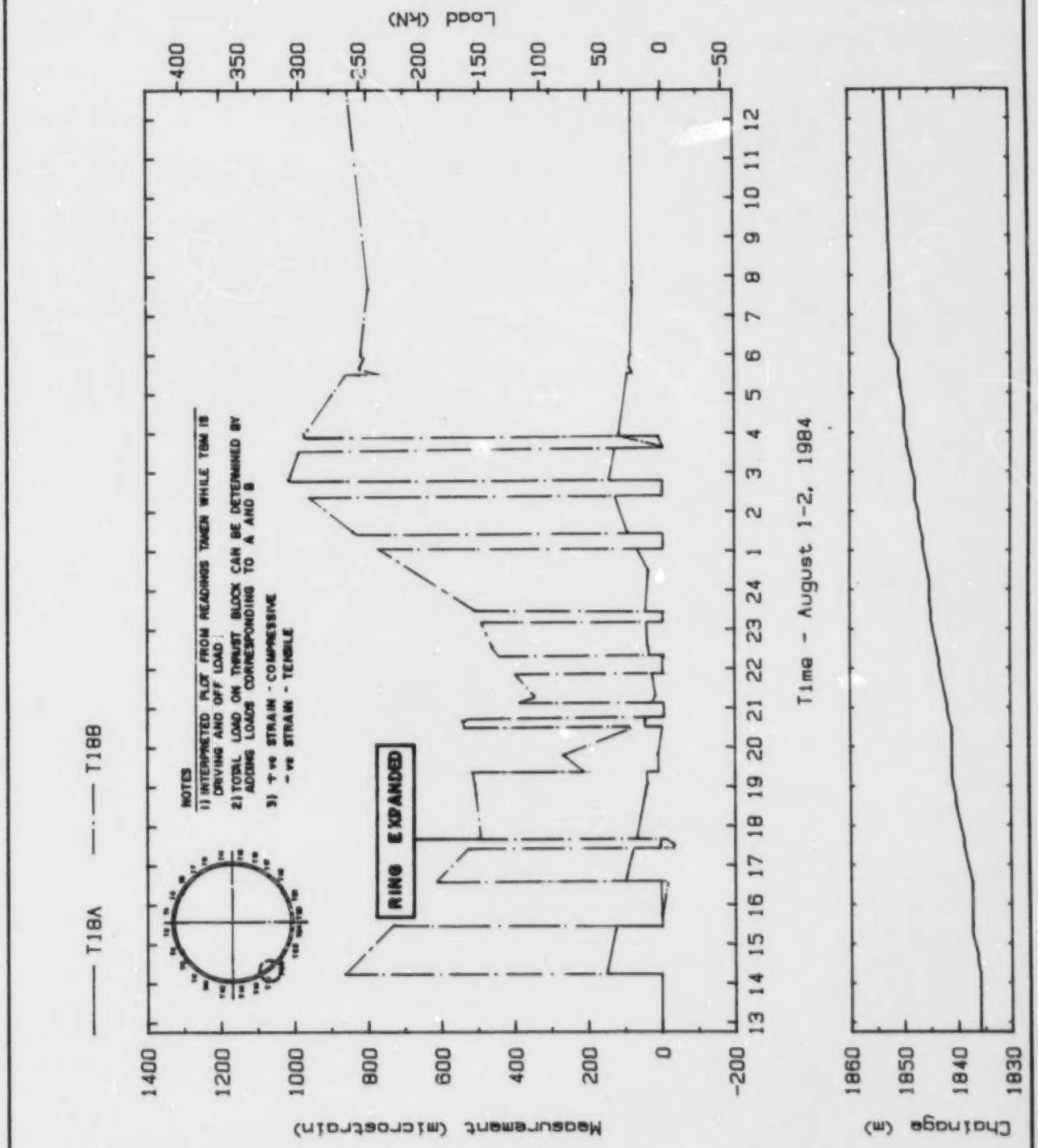
Drawn JLG

Chkd.

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 18) ch. 1831m

FIGURE C.93



Date November 1984

Project No. 831-6014

Golder Associates

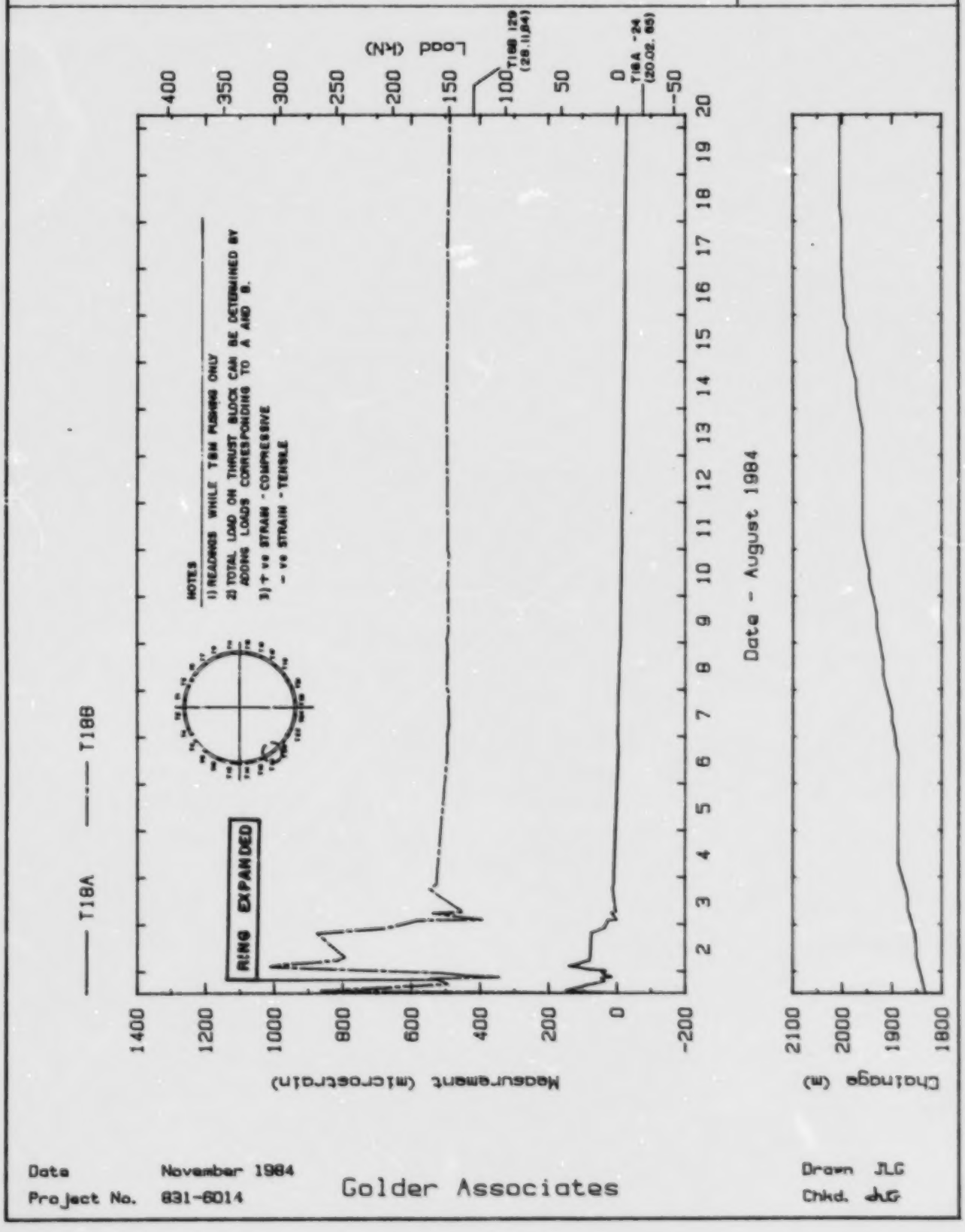
Drawn JLG

Chkd. JLG

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 18) ch. 1831m

FIGURE C.94



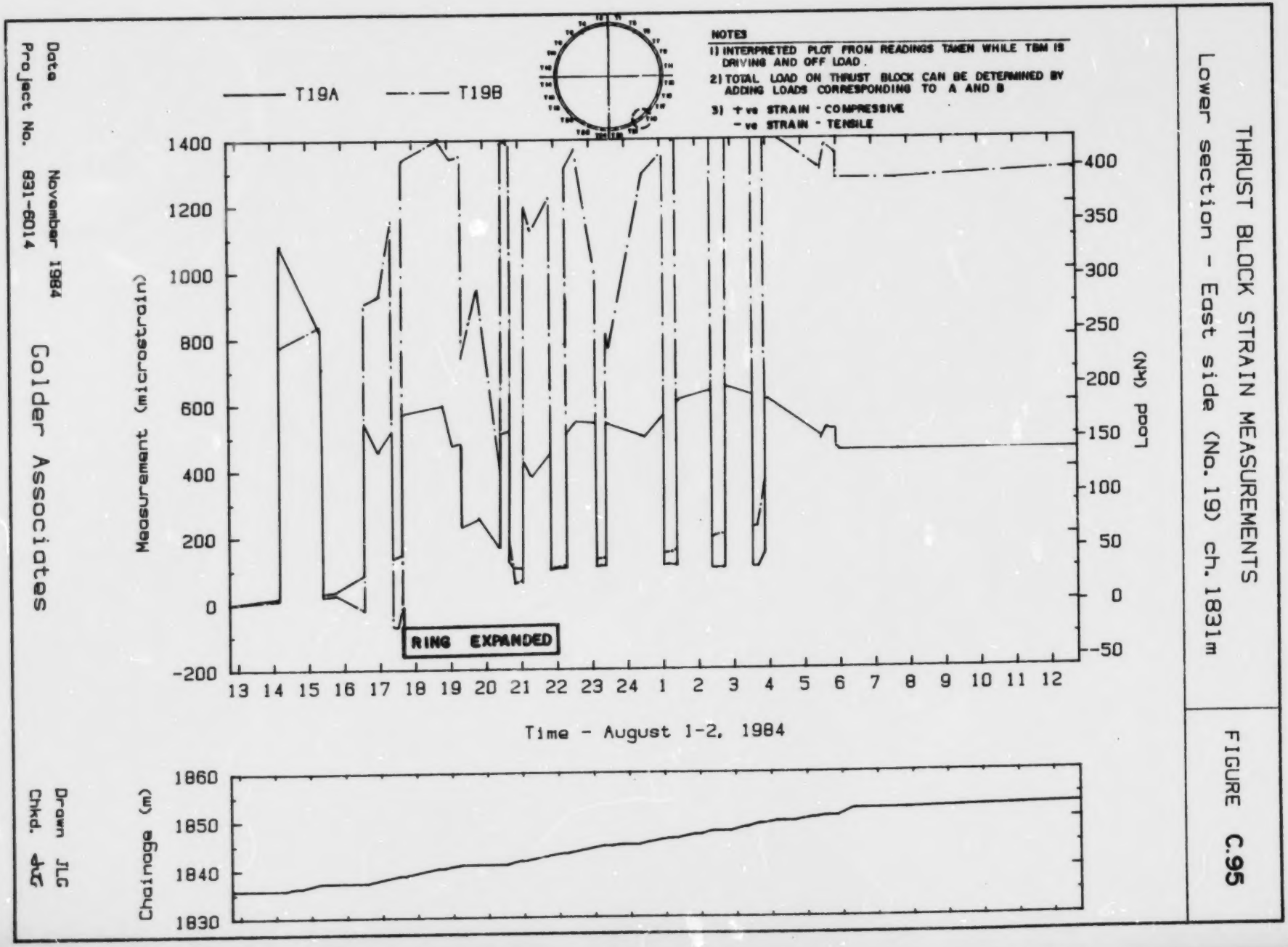
Data November 1984

Project No. 831-6014

Golder Associates

Drawn JLC

Chkd. JLC


THRUST BLOCK STRAIN MEASUREMENTS
Lower section - East side (No. 19) ch. 1831m
FIGURE C.95
NOTES
1) INTERPRETED PLOT FROM READINGS TAKEN WHILE TBM IS DRIVING AND OFF LOAD.
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B
3) +ve STRAIN - COMPRESSIVE
-ve STRAIN - TENSILE
T19A
T19B
Measurement (microstrain)
Load (kN)
RING EXPANDED
Time - August 1-2, 1984
Chainage (m)
Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd.

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - East side (No. 19) ch. 1831m

FIGURE C.96

Date November 1984

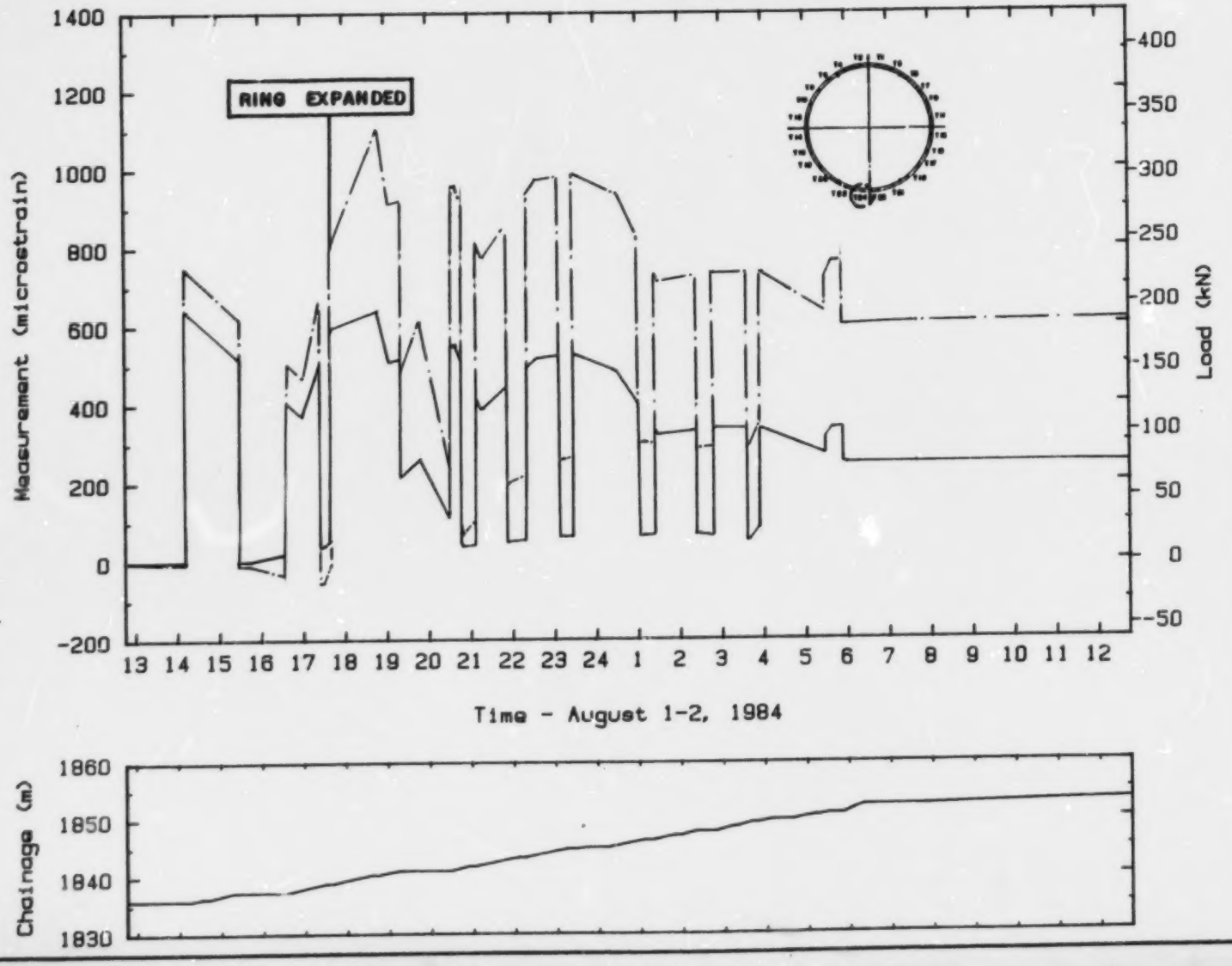
Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JLG

NOTES
1) INTERPRETED PLOT FROM READINGS TAKEN WHILE TBM IS DRIVING AND OFF LOAD.
2) TOTAL LOAD ON THRUST BLOCK CAN BE DETERMINED BY ADDING LOADS CORRESPONDING TO A AND B
3) +ve STRAIN - COMPRESSIVE
-ve STRAIN - TENSILE



Date November 1984
Project No. 831-6014
Golder Associates
Drawn JLG
Chkd. JLG

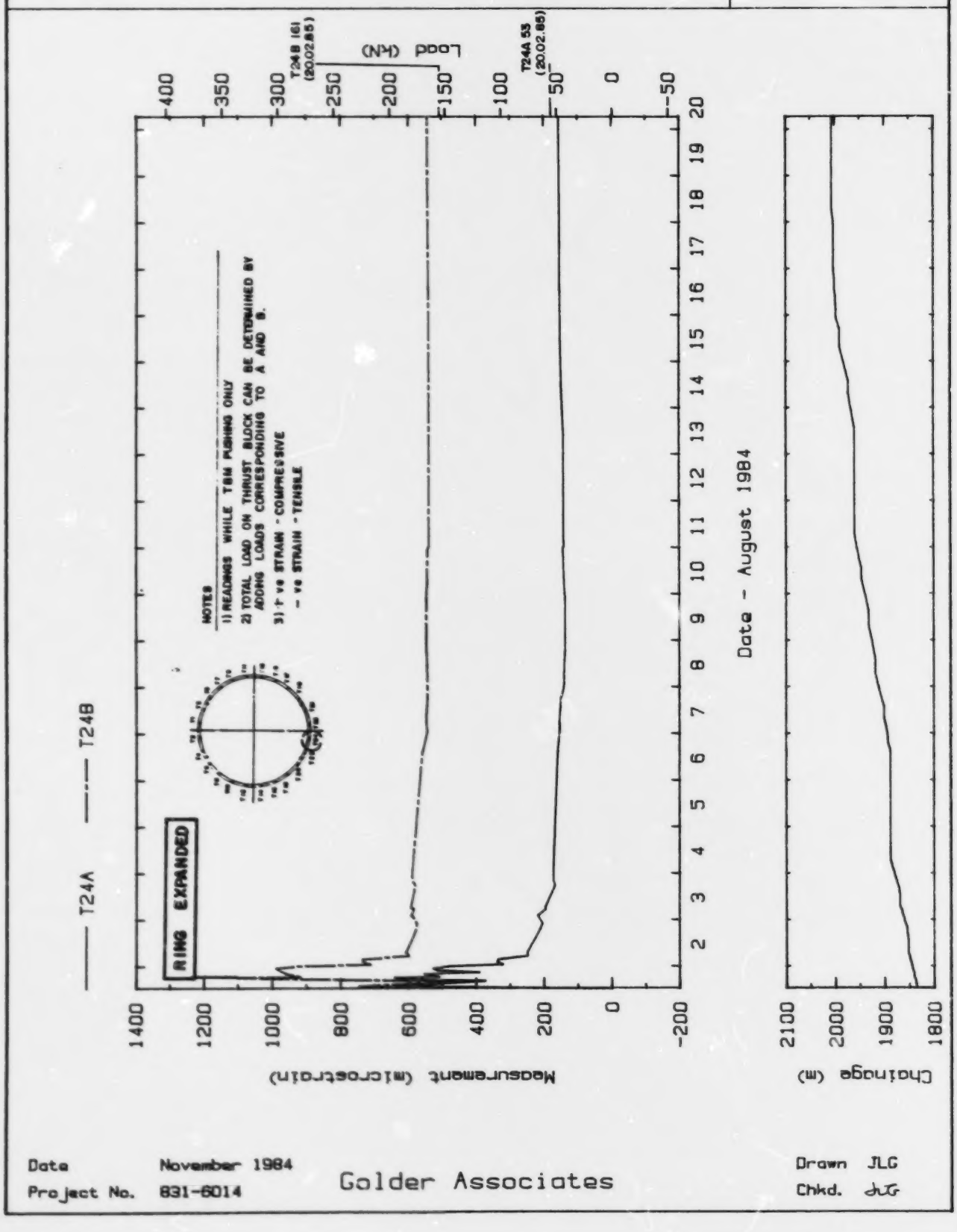
THRUST BLOCK STRAIN MEASUREMENTS
Lower section - West side (No. 24) ch. 1831m

FIGURE C.97

THRUST BLOCK STRAIN MEASUREMENTS

Lower section - West side (No. 24) ch. 1831m

FIGURE C.98



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JLG

APPENDIX C-3

STEEL SET STRAIN GAUGES
DATA AND PLOTS

Reduction of Strain Data Recorded in Steel Set

The following data tables include instrument number, tunnel number, chainage, date installed and datum readings as the first reading column. The steel set gauge numbers are typically designated as SS1A.

where SS1 - Steel Set segment numbers 1 to 6 (see Figure I-5.1)

A - Location A - Left upper side
B - Left lower side
C - Right upper side
D - Right lower side

For each set of readings the date, time and chainage of the tunnel are shown as well as the raw data under the reading column and the difference under Diff column (Period readings).

$$\text{Diff} = r_o - r_1$$

where r_o = datum reading

r_1 = reading taken on date shown

For all readings are in microstrains; positive values are compressive and negative values tensile.

The measured strains in the steel sets for all the instrumentation arrays are presented for each segment separately on Figures C.99 to C.146 including both short and long term graphs. The numbering system for the strain gauges is described above and shown on Figure I-5.1. The position of the instrumented segment for strain measurement purpose is highlighted on each of the plots and the final readings are shown on the right hand margins.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 994 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	16.45	9.04	17.05	9.04	17.25	9.04	17.38	9.04	17.55
Tunnel ch.	989.70	989.70		990.50		990.70		991.00		991.20	
SS1A	1768	1768	0	1796	-28	-	-	1800	-32	1789	-21
SS1B	2014	2014	0	2059	-45	2055	-41	-	-	2053	-39
SS1C	1956	1694	262	1915	41	1917	39	-	-	1902	54
SS1D	1837	1705	132	1716	121	1717	120	1711	126	1679	158
SS2A	2045	2704	-659	2468	-423	2464	-419	2475	-430	2429	-384
SS2B	2229	3359	-1130	3481	-1252	3497	-1268	3525	-1296	3443	-1214
SS2C	1780	1759	21	1829	-49	1852	-72	1844	-64	1813	-33
SS2D	2287	2325	-38	2369	-82	2367	-80	2353	-66	2353	-66
SS3A	2071	2093	-22	2164	-93	2137	-66	2285	-214	2280	-209
SS3B	1883	1878	5	1882	1	1885	-2	1885	-2	1887	-4
SS3C	2173	-	-	-	-	-	-	-	-	-	-
SS3D	2473	-	-	-	-	-	-	-	-	-	-
SS4A	2447	-	-	-	-	-	-	-	-	-	-
SS4B	2244	-	-	2570	-326	-	-	2597	-353	-	-
SS4C	2231	-	-	2535	-304	2531	-300	2544	-313	2623	-392
SS4D	2155	2279	-124	2295	-140	2288	-133	2300	-145	2457	-302
SS5A	2211	3163	-952	-	-	-	-	-	-	2528	-317
SS5B	1802	-	-	-	-	-	-	-	-	2793	-991
SS5C	2052	-	-	-	-	-	-	-	-	-	-
SS5D	2295	-	-	-	-	-	-	-	-	-	-
SS6A	2166	-	-	-	-	-	-	-	-	-	-
SS6B	2586	-	-	-	-	-	-	-	-	-	-
SS6C	2142	-	-	-	-	-	-	-	-	-	-
SS6D	2852	-	-	-	-	-	-	-	-	-	-
Comments	Datum	Ram pressure 1900psi +/- 50 Rams in use 1, 2, 10, 13 to 24									

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	18.10	9.04	18.30	9.04	19.00	9.04	19.15	9.04	19.30
Tunnel ch.	989.70	991.20		991.40		992.20		992.50		992.70	
SS1A	1768	1811	-43	-	-	1854	-86	-	-	1824	-56
SS1B	2014	2078	-64	-	-	2075	-61	-	-	-	-
SS1C	1956	1954	2	1983	-27	1963	-7	-	-	1993	-37
SS1D	1837	1894	-57	1856	-19	1878	-41	1851	-14	1628	209
SS2A	2045	2081	-36	-	-	2116	-71	2105	-60	2106	-61
SS2B	2229	2825	-596	2841	-612	2832	-603	2854	-625	2629	-400
SS2C	1780	1759	21	1861	-81	1823	-43	1860	-80	1704	76
SS2D	2287	2283	4	2336	-49	2353	-66	2353	-66	2233	54
SS3A	2071	2146	-75	2137	-66	2129	-58	2132	-61	2044	27
SS3B	1883	1872	11	1908	-25	1906	-23	1907	-24	1880	3
SS3C	2173	-	-	-	-	-	-	-	-	-	-
SS3D	2473	-	-	-	-	-	-	-	-	-	-
SS4A	2447	2447	0	-	-	-	-	-	-	-	-
SS4B	2244	2275	-31	-	-	-	-	-	-	-	-
SS4C	2231	2280	-49	-	-	-	-	-	-	-	-
SS4D	2155	2070	85	2161	-6	2154	1	2156	-1	2231	-76
SS5A	2211	2290	-79	2293	-82	-	-	2288	-77	2276	-65
SS5B	1802	-	-	-	-	-	-	-	-	-	-
SS5C	2052	-	-	-	-	-	-	-	-	-	-
SS5D	2295	-	-	-	-	-	-	-	-	-	-
SS6A	2166	-	-	-	-	-	-	2166	0	-	-
SS6B	2586	-	-	-	-	2586	0	2582	4	2265	321
SS6C	2142	-	-	-	-	-	-	-	-	-	-
SS6D	2852	-	-	-	-	-	-	-	-	-	-
		No load									
Comments	Datum										

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04	19.48	9.04	20.40	9.04	21.30	9.04	22.30	9.04	23.00
Tunnel ch.	989.70	992.70		993.00		994.20		995.20		995.70	
SS1A	1768	1814	-46	1826	-58	1872	-104	1852	-84	1856	-88
SS1B	2014	-	-	-	-	2103	-89	2068	-54	2075	-61
SS1C	1956	-	-	-	-	1997	-41	-	-	1986	-30
SS1D	1837	1657	180	1723	114	1799	38	1787	50	1788	49
SS2A	2045	-	-	2113	-68	2112	-67	2098	-53	2095	-50
SS2B	2229	2638	-409	2765	-536	2847	-618	2793	-564	2796	-567
SS2C	1780	-	-	-	-	1765	15	-	-	1735	45
SS2D	2287	2247	40	2301	-14	2298	-11	2290	-3	2288	-1
SS3A	2071	2029	42	2067	4	2097	-26	2069	2	2063	8
SS3B	1883	1861	22	1882	1	1878	5	1878	5	1878	5
SS3C	2173	-	-	-	-	-	-	-	-	-	-
SS3D	2473	4801	-2328	-	-	4946	-2473	-	-	4963	-2490
SS4A	2447	2349	98	-	-	2373	74	-	-	2549	-102
SS4B	2244	2400	-156	-	-	2387	-143	2318	-74	2310	-66
SS4C	2231	-	-	-	-	-	-	-	-	-	-
SS4D	2155	2214	-59	2228	-73	2251	-96	2352	-197	2333	-178
SS5A	2211	2314	-103	2328	-117	2323	-112	2363	-152	2362	-151
SS5B	1802	2475	-673	-	-	2485	-683	-	-	2475	-673
SS5C	2052	-	-	-	-	-	-	-	-	-	-
SS5D	2295	-	-	-	-	-	-	-	-	-	-
SS6A	2166	2130	36	2133	33	3149	-983	2166	0	2172	-6
SS6B	2586	2290	296	-	-	2328	258	2339	247	2353	233
SS6C	2142	2142	0	2274	-132	2221	-79	2173	-31	2186	-44
SS6D	2852	2852	0	-	-	2929	-77	-	-	2886	-34
Comments	Datum	No load setting ribs				Static load head not turning				Static load head not turning	

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 4

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	9.04 23.03		9.04	23.35	10.04	14.23	10.04	16.30	10.04	17.20
Tunnel ch.	989.70	995.70		996.00		1004.75		1004.80		1006.20	
SS1A	1768	1848	-80	1856	-88	1852	-84	1862	-94	1863	-95
SS1B	2014	2072	-58	2076	-62	2079	-65	2096	-82	2090	-76
SS1C	1956	1995	-39	1987	-31	1997	-41	1988	-32	1985	-29
SS1D	1837	1807	30	1803	34	1817	20	1808	29	1808	29
SS2A	2045	2106	-61	2091	-46	2115	-70	2102	-57	2103	-58
SS2B	2229	2822	-593	2820	-591	2826	-597	2825	-596	2828	-599
SS2C	1780	1780	0	1753	27	1788	-8	1783	-3	1778	2
SS2D	2287	2312	-25	2290	-3	2316	-29	2320	-33	2320	-33
SS3A	2071	2108	-37	2080	-9	2092	-21	2096	-25	2090	-19
SS3B	1883	1883	0	1884	-1	1887	-4	1888	-5	1891	-8
SS3C	2173	-	-	-	-	-	-	-	-	-	-
SS3D	2473	-	-	-	-	4897	-2424	-	-	4904	-2431
SS4A	2447	2541	-94	-	-	2397	50	-	-	2455	-8
SS4B	2244	2314	-70	2324	-80	2211	33	2298	-54	2282	-38
SS4C	2231	2260	-29	2359	-128	2226	5	2250	-19	2275	-44
SS4D	2155	2307	-152	2303	-148	2132	23	2154	1	2114	41
SS5A	2211	2394	-183	2406	-195	2387	-176	2394	-183	2382	-171
SS5B	1802	-	-	-	-	2486	-684	2473	-671	2475	-673
SS5C	2052	-	-	-	-	-	-	-	-	-	-
SS5D	2295	-	-	-	-	-	-	-	-	-	-
SS6A	2166	2185	-19	2186	-20	2203	-37	2223	-57	2225	-59
SS6B	2586	-	-	-	-	2339	247	2351	235	2360	226
SS6C	2142	2178	-36	-	-	2179	-37	2189	-47	2188	-46
SS6D	2852	-	-	-	-	2877	-25	-	-	2872	-20
Comments	Datum	No load - setting ribs				No load				Static load - head not turning	

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	11.04 15.00		11.04 15.30		11.04 16.30		11.04 19.25		11.04 22.05	
Tunnel ch.	989.70	1019.65		1020.00		1020.62		1023.42		1025.92	
SS1A	1768	1859	-91	1869	-101	1866	-98	1867	-99	1870	-102
SS1B	2014	2081	-67	2091	-77	2092	-78	2088	-74	2089	-75
SS1C	1956	1984	-28	1980	-24	1978	-22	1983	-27	1990	-34
SS1D	1837	1820	17	1807	30	1806	31	1810	27	1810	27
SS2A	2045	2112	-67	2103	-58	2103	-58	2099	-54	2102	-57
SS2B	2229	2826	-597	2826	-597	2829	-600	2831	-602	2832	-603
SS2C	1780	1782	-2	1782	-2	1771	9	1772	8	1772	8
SS2D	2287	2318	-31	2320	-33	2316	-29	2319	-32	2323	-36
SS3A	2071	2081	-10	2090	-19	2098	-27	2103	-32	2096	-25
SS3B	1883	1883	0	1886	-3	1878	5	1886	-3	1884	-1
SS3C	2173	-	-	-	-	-	-	-	-	-	-
SS3D	2473	-	-	-	-	-	-	-	-	-	-
SS4A	2447	2433	14	2449	-2	2483	-36	2510	-63	2518	-71
SS4B	2244	2261	-17	2295	-51	2276	-32	2277	-33	2276	-32
SS4C	2231	2295	-64	2364	-133	2283	-52	2290	-59	2286	-55
SS4D	2155	2064	91	2117	38	2244	-89	2165	-10	2178	-23
SS5A	2211	2379	-168	2413	-202	2381	-170	2305	-94	2419	-208
SS5B	1802	2453	-651	2458	-656	2249	-447	2259	-457	2242	-440
SS5C	2052	-	-	-	-	-	-	-	-	-	-
SS5D	2295	-	-	-	-	-	-	-	-	-	-
SS6A	2166	2208	-42	2231	-65	2227	-61	2228	-62	2232	-66
SS6B	2586	2345	241	2364	222	2364	222	2354	232	2359	227
SS6C	2142	2182	-40	2213	-71	2210	-68	2190	-48	2196	-54
SS6D	2852	2878	-26	2889	-37	2880	-28	2876	-24	2882	-30
		No load									
Comments	Datum										

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	12.04	7.10	12.04	17.15	12.04	21.10	13.04	3.35	13.04	7.26
Tunnel ch.	989.70	1029.00		1030.80		1033.70		1039.26		1042.84	
SS1A	1768	1864	-96	1864	-96	1865	-97	1866	-98	1866	-98
SS1B	2014	2074	-60	-	-	-	-	2059	-45	2057	-43
SS1C	1956	1986	-30	1988	-32	1988	-32	1986	-30	1986	-30
SS1D	1837	1814	23	1812	25	1814	23	1810	27	1809	28
SS2A	2045	2116	-71	2116	-71	2114	-69	2113	-68	2113	-68
SS2B	2229	2820	-591	2820	-591	2822	-593	2823	-594	2822	-593
SS2C	1780	1777	3	1773	7	1767	13	1765	15	1759	21
SS2D	2287	2314	-27	2314	-27	2313	-26	2312	-25	2312	-25
SS3A	2071	2089	-18	2090	-19	2093	-22	2091	-20	2091	-20
SS3B	1883	1883	0	1882	1	1883	0	1881	2	1882	1
SS3C	2173	-	-	-	-	-	-	-	-	-	-
SS3D	2473	4890	-2417	-	-	-	-	-	-	-	-
SS4A	2447	2524	-77	2553	-106	2427	20	2376	71	2385	62
SS4B	2244	2185	59	2167	77	2189	55	2276	-32	2321	-77
SS4C	2231	2098	133	2116	115	2086	145	2117	114	2118	113
SS4D	2155	2337	-182	2328	-173	2332	-177	2294	-139	2299	-144
SS5A	2211	2313	-102	2314	-103	2321	-110	2313	-102	2314	-103
SS5B	1802	2242	-440	2244	-442	2230	-428	2232	-430	2231	-429
SS5C	2052	-	-	-	-	-	-	-	-	-	-
SS5D	2295	-	-	-	-	-	-	-	-	-	-
SS6A	2166	-	-	-	-	-	-	2181	-15	2183	-17
SS6B	2586	2339	247	2341	245	2345	241	2337	249	2337	249
SS6C	2142	2181	-39	2183	-41	2186	-44	2182	-40	2182	-40
SS6D	2852	2874	-22	2886	-34	2883	-31	2883	-31	2873	-21
Comments	Datum										

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	13.04	16.45	13.04	20.45	14.04	5.27	14.04	7.15	16.04	17.00
Tunnel ch.	989.70	1045.80		1049.00		1058.00		1060.00		1061.80	
SS1A	1768	-	-	-	-	1870	-102	1869	-101	1865	-97
SS1B	2014	-	-	-	-	2057	-43	2057	-43	2024	-10
SS1C	1956	1983	-27	1985	-29	1988	-32	1988	-32	1947	9
SS1D	1837	1807	30	1807	30	1803	34	1803	34	1797	40
SS2A	2045	-	-	-	-	2114	-69	2114	-69	2122	-77
SS2B	2229	2815	-586	2817	-588	2809	-580	2809	-580	2771	-542
SS2C	1780	1756	24	1754	26	1753	27	1753	27	1736	44
SS2D	2287	-	-	-	-	2310	-23	2311	-24	2302	-15
SS3A	2071	-	-	-	-	2091	-20	2090	-19	2088	-17
SS3B	1883	-	-	-	-	1883	0	1883	0	1881	2
SS3C	2173	-	-	-	-	-	-	-	-	-	-
SS3D	2473	4768	-2295	4771	-2298	-	-	-	-	-	-
SS4A	2447	2335	112	2336	111	2332	115	2330	117	2323	124
SS4B	2244	-	-	-	-	2313	-69	2316	-72	2318	-74
SS4C	2231	2112	119	2109	122	2103	128	2101	130	2088	143
SS4D	2155	-	-	-	-	2309	-154	2306	-151	2301	-146
SS5A	2211	-	-	-	-	2316	-105	2315	-104	2305	-94
SS5B	1802	-	-	-	-	2231	-429	2228	-426	2225	-423
SS5C	2052	-	-	-	-	-	-	-	-	-	-
SS5D	2295	-	-	-	-	-	-	-	-	-	-
SS6A	2166	2180	-14	2182	-16	2179	-13	2180	-14	2177	-11
SS6B	2586	-	-	-	-	2330	256	2330	256	2310	276
SS6C	2142	2181	-39	2180	-38	2181	-39	2181	-39	2171	-29
SS6D	2852	-	-	-	-	-	-	2838	14	2828	24
Comments	Datum										

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Natien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 8

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	17.04	18.00	18.04	2.00	18.04	18.30	19.04	1.10	19.04	19.00
Tunnel ch.	989.70	1079.50		1086.00		1093.00		1098.00		1112.00	
SS1A	1768	1866	-98	1869	-101	1868	-100	1869	-101	1870	-102
SS1B	2014	2041	-27	2039	-25	2039	-25	2039	-25	2042	-28
SS1C	1956	1958	-2	1963	-7	1966	-10	1970	-14	1971	-15
SS1D	1837	1795	42	1793	44	1793	44	1793	44	1793	44
SS2A	2045	2124	-79	2122	-77	2120	-75	2119	-74	2121	-76
SS2B	2229	2766	-537	2762	-533	2760	-531	2759	-530	2760	-531
SS2C	1780	1740	40	1747	33	1748	32	1747	33	1748	32
SS2D	2287	2302	-15	2300	-13	2298	-11	2298	-11	2297	-10
SS3A	2071	2070	1	2071	0	2070	1	2070	1	2071	0
SS3B	1883	1883	0	1888	-5	1893	-10	1899	-16	1903	-20
SS3C	2173	2682	-509	2686	-513	2690	-517	2690	-517	2690	-517
SS3D	2473	-	-	-	-	-	-	-	-	-	-
SS4A	2447	2316	131	2315	132	2314	133	2314	133	2313	134
SS4B	2244	2305	-61	2307	-63	2310	-66	2313	-69	2324	-80
SS4C	2231	2073	158	2070	161	2066	165	2065	166	2063	168
SS4D	2155	2291	-136	2288	-133	2291	-136	2290	-135	2290	-135
SS5A	2211	2295	-84	2292	-81	2290	-79	2287	-76	2285	-74
SS5B	1802	2220	-418	-	-	-	-	-	-	-	-
SS5C	2052	2052	0	2051	1	2056	-4	2057	-5	2051	1
SS5D	2295	2295	0	2295	0	2300	-5	2303	-8	2309	-14
SS6A	2166	2177	-11	2175	-9	2175	-9	2176	-10	2178	-12
SS6B	2586	2305	281	2305	281	2307	279	2309	277	2307	279
SS6C	2142	2169	-27	2168	-26	2171	-29	2171	-29	2173	-31
SS6D	2852	2831	21	2831	21	2834	18	2834	18	2837	15
Comments	Datum										

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 19:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 9

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	20.04	1.30	23.04	22.45	24.04	6.00	24.04	23.04	25.04	3.00
Tunnel ch.	989.70	1117.30		1128.50		1133.30		1145.00		1149.50	
SS1A	1768	1872	-104	1878	-110	1878	-110	1876	-108	1878	-110
SS1B	2014	2044	-30	2048	-34	2048	-34	2051	-37	2048	-34
SS1C	1956	1970	-14	1964	-8	1964	-8	1963	-7	1964	-8
SS1D	1837	1793	44	1793	44	1793	44	1793	44	1793	44
SS2A	2045	2120	-75	2126	-81	2126	-81	2127	-82	2126	-81
SS2B	2229	-	-	2746	-517	2749	-520	2750	-521	2749	-520
SS2C	1780	1748	32	1750	30	1748	32	1745	35	1748	32
SS2D	2287	-	-	2296	-9	2295	-8	2294	-7	2295	-8
SS3A	2071	2072	-1	2072	-1	2072	-1	2072	-1	2072	-1
SS3B	1883	1906	-23	1852	31	1851	32	1864	19	1851	32
SS3C	2173	2690	-517	-	-	2687	-514	-	-	2687	-514
SS3D	2473	-	-	-	-	-	-	-	-	-	-
SS4A	2447	-	-	2313	134	2314	133	2314	133	2314	133
SS4B	2244	2329	-85	2376	-132	2379	-135	2383	-139	2379	-135
SS4C	2231	2062	169	2059	172	2058	173	2057	174	2058	173
SS4D	2155	2290	-135	2286	-131	2285	-130	2283	-128	2285	-130
SS5A	2211	2285	-74	2282	-71	2280	-69	2279	-68	2280	-69
SS5B	1802	-	-	-	-	-	-	-	-	-	-
SS5C	2052	2050	2	2048	4	2047	5	2047	5	2047	5
SS5D	2295	2315	-20	2320	-25	2319	-24	2319	-24	2319	-24
SS6A	2166	2178	-12	2180	-14	2180	-14	2179	-13	2180	-14
SS6B	2586	-	-	2306	280	2171	415	2304	282	2305	281
SS6C	2142	2173	-31	2172	-30	2184	-42	2169	-27	2171	-29
SS6D	2852	2838	14	2843	9	2842	10	2841	11	2841	11
Comments	Datum										

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 a
Date installed 09/04/84 — Tunnel No. 2 — Sheet 10

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	26.04	1.00	26.04	10.00	4.05	10.00	7.06	11.00	30.07	11.00
Tunnel ch.	989.70	1161.90		1169.15		1254.74		1522.35		1816.45	
SS1A	1768	1877	-109	1881	-113	1877	-109	1935	-167	2160	-392
SS1B	2014	2049	-35	2054	-40	2068	-54	-	-	2060	-46
SS1C	1956	1961	-5	1967	-11	1981	-25	2056	-100	2040	-84
SS1D	1837	1790	47	1791	46	1790	47	1848	-11	1866	-29
SS2A	2045	2126	-81	2128	-83	2134	-89	-	-	2159	-114
SS2B	2229	2750	-521	2743	-514	2737	-508	2716	-487	2706	-477
SS2C	1780	1745	35	1739	41	1732	48	1729	51	1672	108
SS2D	2287	2295	-8	2296	-9	2294	-7	-	-	2401	-114
SS3A	2071	2073	-2	2069	2	2071	0	-	-	2045	26
SS3B	1883	1852	31	1873	10	1870	13	1870	13	1871	12
SS3C	2173	2686	-513	2683	-510	2677	-504	2676	-503	2689	-516
SS3D	2473	-	-	-	-	-	-	-	-	-	-
SS4A	2447	2314	133	2314	133	2413	34	2405	42	2382	65
SS4B	2244	2386	-142	2394	-150	2406	-162	2424	-180	2361	-117
SS4C	2231	2053	178	2053	178	2043	188	2026	205	1964	267
SS4D	2155	2280	-125	2283	-128	2280	-125	2225	-70	2167	-12
SS5A	2211	2280	-69	2281	-70	2265	-54	2207	4	2237	-26
SS5B	1802	-	-	2217	-415	2205	-403	-	-	2184	-382
SS5C	2052	2045	7	2044	8	2035	17	-	-	2094	-42
SS5D	2295	2317	-22	2331	-36	2388	-93	2433	-138	2449	-154
SS6A	2166	2180	-14	2179	-13	2180	-14	2191	-25	2196	-30
SS6B	2586	2305	281	-	-	2270	316	-	-	2297	289
SS6C	2142	2168	-26	2170	-28	2165	-23	2170	-28	2132	10
SS6D	2852	2841	11	2840	12	2841	11	2840	12	2849	3
Comments	Datum					No load		No load		No load	

Notes:

1. Initial readings taken on 09/04/84 at 16.30 except for SS1A, SS1B - 09/04/84 16:45, SS4A - 09/04/84 18:10, SS5C, SS5D - 17/04/84 18:00, SS6A, SS6B - 09/04/84 19:00, SS6C, SS6D - 09/04/84 19:48.
2. Readings taken while TBM driving unless otherwise noted in comments.

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 11

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	9.04	21.09	14.00	20.02	12.00						
Tunnel ch.	989.70	2413.15		3579.78	1985						
SS1A	1768	2247	-479	-	-						
SS1B	2014	2446	-432	2406	-392						
SS1C	1956	1894	62	1941	15						
SS1D	1837	1892	-55	1928	-91						
SS2A	2045	2187	-142	2185	-140						
SS2B	2229	2698	-469	2737	-508						
SS2C	1780	1674	106	1688	92						
SS2D	2287	2412	-125	2419	-132						
SS3A	2071	2046	25	2061	10						
SS3B	1883	1878	5	1872	11						
SS3C	2173	2718	-545	2828	-655						
SS3D	2473	-	-	-	-						
SS4A	2447	2158	289	2029	418						
SS4B	2244	2277	-33	2143	101						
SS4C	2231	1984	247	1966	265						
SS4D	2155	2171	-16	2137	18						
SS5A	2211	2380	-169	2621	-410						
SS5B	1802	-	-	1765	37						
SS5C	2052	2160	-108	2198	-146						
SS5D	2295	2439	-144	2464	-169						
SS6A	2166	2205	-39	2222	-56						
SS6B	2586	2421	165	-	-						
SS6C	2142	2122	20	2122	20						
SS6D	2852	2868	-16	2900	-48						
		No load		No load							
Comments	Datum										

Notes:

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	28.05	10.50	28.05	13.47	28.05	15.30	28.05	15.45	29.05	16.15
Tunnel ch.	1427.97	1427.97		1427.97		1427.97		1428.17		1428.17	
SS1A	1839	1839	0	1836	3	1832	7	1830	9	1832	7
SS1B	1940	1940	0	1939	1	1930	10	1924	16	1926	14
SS1C	2007	2007	0	2009	-2	1956	51	1953	54	1960	47
SS1D	1821	1821	0	1821	0	1750	71	1746	75	1756	65
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1853	0	1852	1	1982	-129	1983	-130	2047	-194
SS2D	1737	1737	0	1736	1	2104	-367	2114	-377	2176	-439
SS3A	1742	1742	0	1742	0	2207	-465	2156	-414	2206	-464
SS3B	1977	1977	0	1975	2	2228	-251	2208	-231	2302	-325
SS3C	2687	-	-	-	-	2687	0	2694	-7	2743	-56
SS3D	2823	-	-	2823	0	3077	-254	3057	-234	-	-
SS4A	1978	1978	0	1997	-19	2413	-435	2340	-362	-	-
SS4B	1796	1796	0	1832	-36	2335	-539	2309	-513	2456	-660
SS4C	1946	1946	0	1910	36	2057	-111	2025	-79	2103	-157
SS4D	2368	2368	0	2325	43	2599	-231	2566	-198	2632	-264
SS5A	1771	1771	0	1770	1	2236	-465	2121	-350	2218	-447
SS5B	-	-	-	-	-	-	-	-	-	-	-
SS5C	1973	1973	0	1972	1	2275	-302	2221	-248	2280	-307
SS5D	2212	2212	0	2210	2	-	-	-	-	-	-
SS6A	2535	2535	0	-	-	2648	-113	2640	-105	-	-
SS6B	1552	1552	0	1550	2	-	-	-	-	-	-
SS6C	2191	2191	0	2189	2	-	-	-	-	4377	-2186
SS6D	1839	1839	0	1843	-4	1854	-15	1838	1	1853	-14
Comments	Datum	No load		No load		Mining 2000 psi		Under load head not turning			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	29.05	28.05	16.50	28.05	17.24	28.05	17.50	28.05	18.00	29.05	19.20
Tunnel ch.	1427.97	1429.10		1429.20		1429.30		1429.30		1430.50	
SS1A	1839	1828	11	1851	-12	1842	-3	1828	11	1577	262
SS1B	1940	1925	15	1852	88	1861	79	1914	26	1977	-37
SS1C	2007	1942	65	1986	21	2021	-14	2000	7	2003	4
SS1D	1821	1759	62	1679	142	1720	101	1832	-11	1791	40
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	2126	-273	2091	-238	2085	-232	1642	211	1765	88
SS2D	1737	2593	-856	2557	-820	2488	-751	1942	-205	2011	-274
SS3A	1742	-	-	2238	-496	2062	-320	1787	-45	1779	-37
SS3B	1977	2325	-348	-	-	1988	-11	1979	-2	2080	-103
SS3C	2687	2772	-85	-	-	-	-	2207	480	2281	406
SS3D	2823	2957	-134	3055	-232	2915	-92	2532	291	2575	248
SS4A	1978	-	-	2368	-390	2319	-341	2123	-145	2087	-109
SS4B	1796	2446	-650	2371	-575	2248	-452	1903	-107	1866	-70
SS4C	1946	2232	-286	2199	-253	2107	-161	1860	86	1980	-34
SS4D	2368	2799	-431	2703	-335	2613	-245	2413	-45	2369	-1
SS5A	1771	2267	-496	2786	-1015	2762	-991	1821	-50	1889	-117
SS5B	-	-	-	-	-	-	-	-	-	-	-
SS5C	1973	2291	-318	2153	-180	2075	-102	1954	19	2091	-118
SS5D	2212	-	-	-	-	-	-	2250	-38	-	-
SS6A	2535	-	-	-	-	2947	-412	2675	-140	-	-
SS6B	1552	-	-	2965	-1413	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	1853	-14	1856	-17	1855	-16	1851	-12	-	-
Comments	Datum	Mining at 2000 psi						No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 m
Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	28.05	19.33	28.05	20.07	28.05	20.55	28.05	21.20	28.05	22.00
Tunnel ch.	1427.97	1430.97		1430.97		1431.50		1432.00		1432.47	
SS1A	1839	1677	162	1723	116	1598	241	1624	215	1533	306
SS1B	1940	1937	3	1989	-49	1961	-21	1962	-22	2038	-98
SS1C	2007	1984	23	1976	31	1928	79	1942	65	1938	69
SS1D	1821	1643	178	1636	185	1613	208	1613	208	1573	248
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1730	123	1731	122	1709	144	1707	146	1639	214
SS2D	1737	1803	-66	1806	-69	1736	1	1754	-17	1710	27
SS3A	1742	1756	-14	1735	7	-	-	1731	11	1715	27
SS3B	1977	2029	-52	2002	-25	1986	-9	1963	14	1905	72
SS3C	2687	2242	445	2225	462	2198	489	2196	491	2156	531
SS3D	2823	-	-	2562	261	2554	269	2539	284	-	-
SS4A	1978	2024	-46	1948	30	2003	-25	2065	-87	1995	-17
SS4B	1796	1910	-114	1850	-54	1759	37	1729	67	1694	102
SS4C	1946	1834	112	1811	135	1768	178	1710	236	1646	300
SS4D	2368	2483	-115	2470	-102	2459	-91	2471	-103	2474	-106
SS5A	1771	1885	-114	1866	-95	1843	-72	1856	-85	1823	-52
SS5B	-	-	-	-	-	-	-	-	-	-	-
SS5C	1973	1946	27	1956	17	1888	85	1881	92	1847	126
SS5D	2212	2231	-19	2190	22	2148	64	2153	59	2155	57
SS6A	2535	-	-	2803	-268	-	-	2834	-299	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
Comments	Datum	After ring expansion		No load		No load				No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets
Date installed 24/05/84 Tunnel No. 2 Chainage 1423 a
Sheet 4

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	29.05	1.00	29.05	1.50	29.05	4.40	29.05	6.00	29.05	6.30
Tunnel ch.	1427.97	1433.30		1433.60		1434.10		1435.47		1435.60	
SS1A	1839	1476	363	1447	392	1440	399	1451	388	1432	407
SS1B	1940	2003	-63	1987	-47	1976	-36	2004	-64	1987	-47
SS1C	2007	1900	107	1870	137	1878	129	1876	131	1888	119
SS1D	1821	1548	273	1525	296	1545	276	1544	277	1563	258
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1564	289	1567	286	1560	293	1569	284	1555	298
SS2D	1737	1636	101	1632	105	1626	111	1630	107	1619	118
SS3A	1742	1701	41	1698	44	1715	27	1695	47	1698	44
SS3B	1977	1865	112	1859	118	1863	114	1864	113	1862	115
SS3C	2687	2140	547	2125	562	2122	565	2122	565	2112	575
SS3D	2823	2499	324	2488	335	2489	334	2488	335	2481	342
SS4A	1978	2081	-103	2018	-40	2090	-112	2025	-47	2112	-134
SS4B	1796	1677	119	1646	150	1656	140	1632	164	1644	152
SS4C	1946	1448	498	1418	528	1397	549	1394	552	1363	583
SS4D	2368	2427	-59	2408	-40	2431	-63	2421	-53	2444	-76
SS5A	1771	1803	-32	1777	-6	1814	-43	1772	-1	1822	-51
SS5B	-	-	-	-	-	-	-	-	-	-	-
SS5C	1973	1772	201	1771	202	1775	198	1772	201	1867	106
SS5D	2212	2056	156	2030	182	2036	176	2049	163	1954	259
SS6A	2535	-	-	-	-	-	-	-	-	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2171	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
Comments	Datum			No load				No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	29.05 7.30		29.05 16.40		29.05 17.25		29.05 18.15		29.05 18.55	
Tunnel ch.	1427.97	1437.17		1439.30		1439.97		1441.47		1442.50	
SS1A	1839	1415	424	1520	319	1516	323	1515	324	1489	350
SS1B	1940	2029	-89	2124	-184	2129	-189	2107	-167	-	-
SS1C	2007	1876	131	1934	73	1946	61	1917	90	1943	64
SS1D	1821	1545	276	1720	101	1711	110	1648	173	1697	124
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1579	274	1722	131	1728	125	1746	107	1717	136
SS2D	1737	1624	113	1723	14	1724	13	1721	16	1712	25
SS3A	1742	1696	46	1734	8	1745	-3	1732	10	1736	6
SS3B	1977	1863	114	1941	36	1951	26	1933	44	1930	47
SS3C	2687	2098	589	2149	538	2154	533	2152	535	2152	535
SS3D	2823	2476	347	2513	310	2523	300	2522	301	2519	304
SS4A	1978	2009	-31	2176	-198	2188	-210	2119	-141	2178	-200
SS4B	1796	1599	197	1692	104	1694	102	1652	144	1661	135
SS4C	1946	1291	655	1406	540	1404	542	1377	569	1358	588
SS4D	2368	2415	-47	2499	-131	2505	-137	2484	-116	2474	-106
SS5A	1771	1753	18	1848	-77	1873	-102	1767	4	1807	-36
SS5B	-	-	-	-	-	-	-	-	-	-	-
SS5C	1973	1858	115	1877	96	1899	74	1825	148	1821	152
SS5D	2212	1947	265	2052	160	2030	182	2067	145	2031	181
SS6A	2535	-	-	-	-	-	-	-	-	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
		No load						No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	29.05	19.25	29.05	20.30	29.05	21.15	30.05	2.15	30.05	5.55
Tunnel ch.	1427.97	1442.97		1443.50		1444.00		1448.97		1452.70	
SS1A	1839	1489	350	1502	337	1499	340	1475	364	1475	364
SS1B	1940	-	-	-	-	-	-	-	-	-	-
SS1C	2007	1919	88	1944	63	1927	80	1921	86	1920	87
SS1D	1821	1677	144	1687	134	1673	148	1639	182	1618	203
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1739	114	1711	142	1739	114	1701	152	1680	173
SS2D	1737	1715	22	1703	34	1709	28	1681	56	1658	79
SS3A	1742	1729	13	1733	9	1729	13	1713	29	-	-
SS3B	1977	1927	50	1915	62	-	-	1880	97	1878	99
SS3C	2687	2152	535	2150	537	2150	537	2128	559	2111	576
SS3D	2823	2519	304	2513	310	2514	309	2494	329	2473	350
SS4A	1978	2126	-148	2189	-211	2139	-161	2102	-124	2061	-83
SS4B	1796	1636	160	1646	150	1636	160	1540	256	1471	325
SS4C	1946	1352	594	1328	618	1343	603	1099	847	937	1009
SS4D	2368	2499	-131	2485	-117	2508	-140	2401	-33	2325	43
SS5A	1771	1778	-7	1815	-44	1786	-15	1651	120	1625	146
SS5B	-	-	-	-	-	-	-	-	-	-	-
SS5C	1973	1840	133	1825	148	1855	118	1772	201	1759	214
SS5D	2212	2039	173	2002	210	2024	188	1907	305	1854	358
SS6A	2535	-	-	-	-	-	-	-	-	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
Comments	Datum					No load					

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 a
Date installed 24/05/84 — Tunnel No. 2 — Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	30.05	21.44	30.05	23.28	31.05	2.35	31.05	5.55	31.05	22.56
Tunnel ch.	1427.97	1462.00		1464.50		1468.00		1471.50		1482.50	
SS1A	1839	1333	506	1331	508	1317	522	1299	540	1276	563
SS1B	1940	2101	-161	-	-	2102	-162	2098	-158	-	-
SS1C	2007	1913	94	1909	98	1909	98	1908	99	1907	100
SS1D	1821	1592	229	-	-	1582	239	1571	250	1553	268
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1655	198	1658	195	1655	198	1651	202	1654	199
SS2D	1737	1631	106	1629	108	1626	111	1620	117	1609	128
SS3A	1742	1710	32	1724	18	-	-	-	-	1700	42
SS3B	1977	1869	108	1865	112	1861	116	1869	108	1842	135
SS3C	2687	2108	579	2109	578	2106	581	2103	584	2113	574
SS3D	2823	2463	360	2457	366	2439	384	2441	382	2436	387
SS4A	1978	1865	113	1865	113	1878	100	1797	181	1732	246
SS4B	1796	-	-	-	-	-	-	-	-	-	-
SS4C	1946	686	1260	942	1004	756	1190	707	1239	650	1296
SS4D	2368	2296	72	2330	38	2447	-79	2421	-53	2406	-38
SS5A	1771	1544	227	1588	183	1506	265	1493	278	1238	533
SS5B	-	2934	-	2973	-	2939	-	2908	-	-	-
SS5C	1973	1787	186	1807	166	1776	197	1775	198	1770	203
SS5D	2212	1837	375	1848	364	1844	368	1841	371	1825	387
SS6A	2535	-	-	-	-	-	-	-	-	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet B

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	1.06	2.00	1.06	6.00	2.06	2.30	2.06	5.45	4.06	19.00
Tunnel ch.	1427.97	1485.50		1490.00		1505.50		1508.00		1513.90	
SS1A	1839	1270	569	1264	575	1233	606	1228	611	1176	663
SS1B	1940	2095	-155	2094	-154	2080	-140	2078	-138	2057	-117
SS1C	2007	1904	103	1901	106	1883	124	1878	129	1847	160
SS1D	1821	1550	271	1547	274	1530	291	1526	295	1495	326
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1649	204	1646	207	1631	222	1630	223	1603	250
SS2D	1737	1608	129	1606	131	1588	149	1586	151	1544	193
SS3A	1742	1698	44	1699	43	1694	48	1694	48	1677	65
SS3B	1977	1846	131	1846	131	1844	133	1844	133	1828	149
SS3C	2687	2112	575	2107	580	2091	596	2093	594	2090	597
SS3D	2823	2435	388	2431	392	2429	394	2427	396	2411	412
SS4A	1978	1683	295	1653	325	1591	387	1569	409	1335	643
SS4B	1796	-	-	-	-	-	-	-	-	-	-
SS4C	1946	627	1319	608	1338	556	1390	538	1408	-	-
SS4D	2368	2394	-26	2386	-18	2351	17	2355	13	2248	120
SS5A	1771	1230	541	1218	553	1124	647	1118	653	1094	677
SS5B	-	2384	-	2375	-	2431	-	2453	-	2384	-
SS5C	1973	1769	204	1769	204	1773	200	1773	200	1731	242
SS5D	2212	1815	397	1816	396	1797	415	1797	415	1755	457
SS6A	2535	-	-	-	-	-	-	-	-	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 9

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	4.06	22.30	6.06	6.20	6.06	17.00	7.06	10.00	12.06	9.45
Tunnel ch.	1427.97	1517.00		1522.35		1522.35		1522.35		1522.70	
SS1A	1839	1175	664	1311	528	1314	525	1308	531	1384	455
SS1B	1940	2060	-120	2142	-202	2149	-209	2154	-214	2205	-265
SS1C	2007	1846	161	1931	76	1933	74	1927	80	1939	68
SS1D	1821	1494	327	1548	273	1549	272	1545	276	1547	274
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1602	251	1615	238	1609	244	1607	246	1600	253
SS2D	1737	1543	194	1547	190	1545	192	1544	193	1538	199
SS3A	1742	1676	66	1678	64	1679	63	1677	65	1680	62
SS3B	1977	1828	149	1832	145	1833	144	1832	145	1836	141
SS3C	2687	2090	597	2090	597	2093	594	2094	593	2106	581
SS3D	2823	2411	412	2411	412	2411	412	2409	414	2405	418
SS4A	1978	1320	658	1443	535	1435	543	1426	552	1417	561
SS4B	1796	-	-	-	-	-	-	-	-	-	-
SS4C	1946	-	-	515	1431	502	1444	485	1461	-	-
SS4D	2368	2247	121	2417	-49	2409	-41	2405	-37	2417	-49
SS5A	1771	1099	672	1265	506	1261	510	1256	515	1300	471
SS5B	-	2386	-	2579	-	2567	-	2561	-	2533	-
SS5C	1973	1730	243	1838	135	1836	137	1830	143	1833	140
SS5D	2212	1753	459	1862	350	1858	354	1852	360	1853	359
SS6A	2535	-	-	-	-	-	-	-	-	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
				No load		No load		No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 10

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	15.06	2.15	15.06	5.30	28.06	21.00	31.07	10.00	21.09	14.00
Tunnel ch.	1427.97	1569.00		1572.50		1627.78		1820.90		2413.15	
SS1A	1839	1436	403	1436	403	1575	264	1720	119	1516	323
SS1B	1940	2228	-288	2229	-289	2288	-348	2330	-390	2362	-422
SS1C	2007	1950	57	1950	57	1962	45	1952	55	1962	45
SS1D	1821	1555	266	1556	265	1598	223	1583	238	1513	308
SS2A	-	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	1853	1607	246	1607	246	1649	204	1605	248	1596	257
SS2D	1737	1552	185	1552	185	1582	155	1550	187	1722	15
SS3A	1742	1683	59	1683	59	1687	55	1712	30	1703	39
SS3B	1977	1840	137	1840	137	1845	132	1879	98	1897	80
SS3C	2687	2122	565	2123	564	2177	510	2265	422	2296	391
SS3D	2823	2407	416	2407	416	2393	430	2369	454	2330	493
SS4A	1978	-	-	-	-	1576	402	1469	509	1215	763
SS4B	1796	-	-	-	-	-	-	-	-	-	-
SS4C	1946	-	-	-	-	521	1425	-	-	-	-
SS4D	2368	2452	-84	2452	-84	2554	-186	2503	-135	2359	9
SS5A	1771	1340	431	1340	431	1425	346	1440	331	1376	395
SS5B	-	2550	-	2548	-	2589	-	2389	-	2284	-
SS5C	1973	1861	112	1858	115	1919	54	1944	29	1912	61
SS5D	2212	1872	340	1870	342	1926	286	1899	313	1814	398
SS6A	2535	-	-	-	-	-	-	-	-	-	-
SS6B	1552	-	-	-	-	-	-	-	-	-	-
SS6C	2191	-	-	-	-	-	-	-	-	-	-
SS6D	1839	-	-	-	-	-	-	-	-	-	-
						No load		No load		No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 11

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	28.05	28.11	10.00	20.02	12.00						
Tunnel ch.	1427.97	3292.08		3579.78	1985						
SS1A	1839	1568	271	1510	329						
SS1B	1940	2393	-453	2418	-478						
SS1C	2007	1900	107	-	-						
SS1D	1821	1456	365	1418	403						
SS2A	-	3324	-	-	-						
SS2B	-	-	-	-	-						
SS2C	1853	1558	295	1513	340						
SS2D	1737	1706	31	1684	53						
SS3A	1742	1661	81	1634	108						
SS3B	1977	1861	116	1836	141						
SS3C	2687	2304	383	2301	386						
SS3D	2823	2291	532	2263	560						
SS4A	1978	1030	948	971	1007						
SS4B	1796	-	-	-	-						
SS4C	1946	-	-	-	-						
SS4D	2368	2227	141	2164	204						
SS5A	1771	1324	447	1297	474						
SS5B	-	2279	-	2150	-						
SS5C	1973	1856	117	1800	173						
SS5D	2212	1739	473	-	-						
SS6A	2535	-	-	-	-						
SS6B	1552	-	-	-	-						
SS6C	2191	-	-	-	-						
SS6D	1839	-	-	-	-						
		No load		No load							
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	1.08	12.45	1.08	14.20	1.08	15.45	1.08	17.00	1.08	17.20
Tunnel ch.	1835.90	1835.90		1836.00		1837.40		1838.00		1838.50	
SS1A	1881	1881	0	1880	1	1880	1	1881	0	1883	-2
SS1B	2130	2130	0	2110	20	2167	-37	2167	-37	2059	71
SS1C	2085	2085	0	2171	-86	2075	10	2032	53	2104	-19
SS1D	2095	2095	0	2335	-240	2106	-11	2128	-33	1902	193
SS2A	2077	2077	0	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	2144	0	1512	632	1830	314	1846	298	2049	95
SS2D	2484	2484	0	1745	739	1834	650	1975	509	1681	803
SS3A	1950	1950	0	2054	-104	1974	-24	1989	-39	1908	42
SS3B	2126	2126	0	1927	199	2031	95	2105	21	1954	172
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	2483	-	-	-	-	-	-	-	-	-	-
SS4A	2198	2198	0	2328	-130	2252	-54	2338	-140	2309	-111
SS4B	1920	1920	0	2015	-95	1967	-47	2180	-260	2313	-393
SS4C	2591	-	-	2944	-	2591	0	-	-	2499	92
SS4D	2630	2640	-10	3034	-	2694	-64	2837	-207	3075	-445
SS5A	1881	3746	-	-	-	-	-	-	-	-	-
SS5B	2075	4128	-	-	-	3349	-	-	-	-	-
SS5C	1938	-	-	-	-	-	-	-	-	-	-
SS5D	1858	1858	0	1872	-14	1874	-16	1872	-14	1813	45
SS6A	1982	1982	0	2199	-217	2134	-152	2124	-142	2079	-97
SS6B	1842	-	-	-	-	-	-	-	-	-	-
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum	No load				No load					

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	1.08	17.30	1.08	17.52	1.08	18.52	1.08	19.10	1.08	19.49
Tunnel ch.	1835.90	1838.90		1839.00		1840.50		1841.00		1841.10	
SS1A	1881	1882	-1	1883	-2	1883	-2	1882	-1	1880	1
SS1B	2130	2178	-48	2209	-79	2248	-118	2238	-108	2230	-100
SS1C	2085	2066	19	1995	90	2015	70	1998	87	1977	108
SS1D	2095	2109	-14	2126	-31	2115	-20	2111	-16	2109	-14
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1804	340	1800	344	1763	381	1756	388	1738	406
SS2D	2484	1861	623	1836	648	1857	627	1844	640	1831	653
SS3A	1950	1973	-23	1908	42	1918	32	1900	50	1885	65
SS3B	2126	2050	76	2036	90	2020	106	2026	100	2006	120
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	-	-	-	-
SS4A	2198	2312	-114	2286	-88	2246	-48	2237	-39	2203	-5
SS4B	1920	2045	-125	2088	-168	2128	-208	2132	-212	2101	-181
SS4C	2591	2606	-15	2498	93	2425	166	2291	300	-	-
SS4D	2630	2841	-211	2871	-241	2961	-331	2983	-353	2963	-333
SS5A	1881	-	-	-	-	1881	0	1881	0	1879	2
SS5B	2075	-	-	-	-	2075	0	2058	17	2039	36
SS5C	1938	-	-	-	-	-	-	-	-	-	-
SS5D	1858	1872	-14	1874	-16	1871	-13	1873	-15	1870	-12
SS6A	1982	2051	-69	2079	-97	2150	-168	2153	-171	2121	-139
SS6B	1842	-	-	1842	0	-	-	-	-	-	-
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
		No load								No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	1.08	20.40	1.08	20.50	1.08	21.20	1.08	21.56	1.08	22.35
Tunnel ch.	1835.90	1841.50		1841.90		1842.20		1843.40		1843.70	
SS1A	1881	1883	-2	1883	-2	1883	-2	1882	-1	1883	-2
SS1B	2130	2230	-100	2229	-99	2222	-92	2231	-101	2226	-96
SS1C	2085	1963	122	2019	66	1937	148	2006	79	1960	125
SS1D	2095	2103	-8	2125	-30	2086	9	2119	-24	2093	2
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1734	410	1730	414	-	-	-	-	-	-
SS2D	2484	1825	659	1833	651	1817	667	1835	649	1813	671
SS3A	1950	1893	57	1888	62	1897	53	1884	66	1903	47
SS3B	2126	2017	109	2016	110	2017	109	2018	108	2010	116
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	-	-	-	-
SS4A	2198	2195	3	2160	38	2169	29	2125	73	2146	52
SS4B	1920	2134	-214	2090	-170	2149	-229	2124	-204	2170	-250
SS4C	2591	-	-	-	-	-	-	2611	-20	-	-
SS4D	2630	2908	-278	2860	-230	3070	-440	3227	-597	3263	-633
SS5A	1881	1883	-2	1876	5	1885	-4	1893	-12	1884	-3
SS5B	2075	2042	33	1992	83	2029	46	1988	87	2000	75
SS5C	1938	1938	0	2171	-233	2164	-226	2081	-143	2077	-139
SS5D	1858	1872	-14	1870	-12	1872	-14	1869	-11	1872	-14
SS6A	1982	-	-	2135	-153	2307	-325	2303	-321	2285	-303
SS6B	1842	1794	48	-	-	-	-	-	-	2059	-217
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
				No load				No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 4

Date/Time	Reading 1.08	Reading 1.08 23.15	Diff.	Reading 2.08 .15	Diff.	Reading 2.08 1.05	Diff.	Reading 2.08 1.25	Diff.	Reading 2.08 2.15	Diff.
Tunnel ch.	1835.90	1844.90		1845.00		1846.40		1846.50		1847.90	
SS1A	1881	1883	-2	1883	-2	1882	-1	1883	-2	1883	-2
SS1B	2130	2234	-104	2231	-101	2238	-108	2235	-105	2236	-106
SS1C	2085	1994	91	1950	135	1982	103	1979	106	1973	112
SS1D	2095	2117	-22	2100	-5	2116	-21	2116	-21	2115	-20
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	-	-	-	-	-	-	-	-	-	-
SS2D	2484	1832	652	-	-	-	-	-	-	-	-
SS3A	1950	1880	70	1910	40	1877	73	1911	39	1874	76
SS3B	2126	2004	122	2005	121	1988	138	2006	120	1972	154
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	-	-	-	-
SS4A	2198	2110	88	2132	66	2088	110	2140	58	2075	123
SS4B	1920	2119	-199	2163	-243	2114	-194	2179	-259	2110	-190
SS4C	2591	-	-	-	-	-	-	-	-	-	-
SS4D	2630	3216	-586	3222	-592	3167	-537	3194	-564	3162	-532
SS5A	1881	1885	-4	1881	0	1876	5	1886	-5	1875	6
SS5B	2075	1966	109	1986	89	1960	115	2020	55	1966	109
SS5C	1938	2051	-113	2059	-121	2050	-112	2090	-152	2068	-130
SS5D	1858	1871	-13	1869	-11	1870	-12	1869	-11	1871	-13
SS6A	1982	2318	-336	2347	-365	2325	-343	2336	-354	2329	-347
SS6B	1842	-	-	-	-	-	-	-	-	-	-
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum	No load				No load				No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	2.08	2.45	2.08	3.35	2.08	3.55	2.08	5.35	2.08	5.55
Tunnel ch.	1835.90	1848.00		1849.40		1849.80		1850.90		1851.00	
SS1A	1881	1883	-2	1883	-2	1883	-2	1883	-2	1883	-2
SS1B	2130	2230	-100	2234	-104	2233	-103	2233	-103	2231	-101
SS1C	2085	1964	121	1958	127	1951	134	1949	136	1928	157
SS1D	2095	2111	-16	2116	-21	2119	-24	2120	-25	2113	-18
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	-	-	-	-	-	-	-	-	-	-
SS2D	2484	-	-	-	-	-	-	-	-	-	-
SS3A	1950	1908	42	1869	81	1904	46	1893	57	1891	59
SS3B	2126	2012	114	1958	168	2001	125	1996	130	1989	137
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	2578	-	-	-	-	-
SS4A	2198	2121	77	2072	126	2108	90	2100	98	2078	120
SS4B	1920	2162	-242	2110	-190	2160	-240	2172	-252	2161	-241
SS4C	2591	2025	566	-	-	2208	383	-	-	-	-
SS4D	2630	3100	-470	3101	-471	3088	-458	3276	-646	3269	-639
SS5A	1881	1878	3	1883	-2	1888	-7	1889	-8	1890	-9
SS5B	2075	2014	61	1967	108	2013	62	2027	48	2011	64
SS5C	1938	2126	-188	2096	-158	2130	-192	2110	-172	2103	-165
SS5D	1858	1870	-12	1873	-15	1871	-13	1870	-12	1871	-13
SS6A	1982	2346	-364	2332	-350	2348	-366	2346	-364	2335	-353
SS6B	1842	-	-	-	-	-	-	-	-	-	-
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
				No load				No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets
Date installed 01/08/84 Tunnel No. 2 Chainage 1831 m
Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	2.08	7.40	2.08	19.45	2.08	22.30	3.08	18.00	3.08	21.00
Tunnel ch.	1835.90	1853.50		1855.50		1858.50		1874.00		1877.00	
SS1A	1881	1883	-2	1883	-2	1883	-2	1883	-2	1883	-2
SS1B	2130	2233	-103	2225	-95	2217	-87	2198	-68	2187	-57
SS1C	2085	1934	151	1892	193	1865	220	1819	266	1803	282
SS1D	2095	2120	-25	2102	-7	2100	-5	2084	11	2074	21
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	-	-	1710	434	1698	446	1640	504	1625	519
SS2D	2484	-	-	1806	678	1808	676	1755	729	1739	745
SS3A	1950	1898	52	1861	89	1831	119	1797	153	1792	158
SS3B	2126	1997	129	1887	239	1899	227	1836	290	1819	307
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	2512	-	2521	-
SS4A	2198	2070	128	1990	208	1957	241	1807	391	1807	391
SS4B	1920	2146	-226	-	-	-	-	-	-	-	-
SS4C	2591	-	-	2145	446	2036	555	1864	727	1817	774
SS4D	2630	3231	-601	3252	-622	3322	-692	-	-	-	-
SS5A	1881	1892	-11	1886	-5	1885	-4	1882	-1	1880	1
SS5B	2075	1993	82	2000	75	1964	111	1856	219	1850	225
SS5C	1938	2063	-125	2046	-108	2057	-119	1899	39	1885	53
SS5D	1858	1872	-14	1868	-10	1869	-11	1869	-11	1869	-11
SS6A	1982	2348	-366	2304	-322	2306	-324	2269	-287	2262	-280
SS6B	1842	-	-	1883	-41	1885	-43	1750	92	1734	108
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-

Comments: Datum

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: August 1984 Golder Associates Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	6.08	15.10	6.08	15.30	7.08	1.00	7.08	1.30	7.08	5.25
Tunnel ch.	1835.90	1889.10		1889.74		1896.00		1896.20		1899.00	
SS1A	1881	1883	-2	1883	-2	1883	-2	1883	-2	1883	-2
SS1B	2130	2138	-8	2138	-8	2134	-4	2134	-4	2136	-6
SS1C	2085	1736	349	1736	349	1733	352	1733	352	1734	351
SS1D	2095	2030	65	2031	64	2027	68	2026	69	2028	67
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1577	567	1577	567	1575	569	1575	569	1573	571
SS2D	2484	1677	807	1677	807	1675	809	1675	809	1673	811
SS3A	1950	1773	177	1774	176	1777	173	1777	173	1777	173
SS3B	2126	1809	317	1810	316	1810	316	1810	316	1809	317
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	2499	-	2500	-	-	-
SS4A	2198	1745	453	1745	453	1765	433	1766	432	1760	438
SS4B	1920	1725	195	1723	197	1741	179	1740	180	1729	191
SS4C	2591	1563	1028	1563	1028	1575	1016	1575	1016	1565	1026
SS4D	2630	-	-	-	-	-	-	-	-	-	-
SS5A	1881	1872	9	1872	9	1856	25	1856	25	1903	-22
SS5B	2075	1775	300	1775	300	1713	362	1712	363	1833	242
SS5C	1938	1811	127	1811	127	1800	138	1800	138	1799	139
SS5D	1858	1867	-9	1867	-	1870	-12	1870	-12	1870	-12
SS6A	1982	2218	-236	2217	-235	2216	-234	2216	-234	2215	-233
SS6B	1842	1651	191	1652	190	1650	192	1650	192	1650	192
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 8

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	7.08	6.00	7.08	18.40	7.08	21.53	8.08	1.15	8.08	5.30
Tunnel ch.	1835.90	1899.50		1906.50		1909.20		1913.20		1916.70	
SS1A	1881	1883	-2	1883	-2	1883	-2	1882	-1	1882	-1
SS1B	2130	2135	-5	2135	-5	2135	-5	2132	-2	2131	-1
SS1C	2085	1732	353	1729	356	1729	356	1728	357	1729	356
SS1D	2095	2027	68	2019	76	2015	80	2011	84	2010	85
SS2A	2077	-	-	-	-	-	-	-	-	2077	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1573	571	1568	576	1568	576	1565	579	1565	579
SS2D	2484	1672	812	1666	818	1666	818	1661	823	1661	823
SS3A	1950	1777	173	1775	175	1774	176	1773	177	1773	177
SS3B	2126	1809	317	1803	323	1803	323	1802	324	1802	324
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	-	-	-	-
SS4A	2198	1760	438	1751	447	1748	450	1757	441	1754	444
SS4B	1920	1729	191	1708	212	1700	220	1700	220	1693	227
SS4C	2591	1563	1028	1540	1051	1534	1057	1531	1060	1523	1068
SS4D	2630	-	-	-	-	-	-	-	-	-	-
SS5A	1881	1903	-22	1900	-19	1898	-17	1903	-22	1890	-9
SS5B	2075	1832	243	1805	270	1807	268	1802	273	1780	295
SS5C	1938	1797	141	-	-	-	-	-	-	-	-
SS5D	1858	1870	-12	1871	-13	1871	-13	1870	-12	1870	-12
SS6A	1982	2216	-234	2214	-232	2213	-231	2212	-230	2208	-226
SS6B	1842	1649	193	1644	198	1642	200	1639	203	1636	206
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum	No load									

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 9

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	8.08	18.31	8.08	22.52	9.08	1.30	9.08	6.20	9.08	21.09
Tunnel ch.	1835.90	1921.80		1924.30		1926.70		1930.70		1937.20	
SS1A	1881	1882	-1	1881	0	1881	0	1881	0	1881	0
SS1B	2130	2126	4	2122	8	2118	12	2118	12	2106	24
SS1C	2085	1727	358	1724	361	1718	367	1720	365	1710	375
SS1D	2095	2007	88	2004	91	1998	97	1998	97	1986	109
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1560	584	1558	586	1556	588	1555	589	1548	596
SS2D	2484	1653	831	1650	834	1649	835	1646	838	1638	846
SS3A	1950	1766	184	1762	188	1761	189	1759	191	1753	197
SS3B	2126	1791	335	1789	337	1788	338	1787	339	1783	343
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	-	-	-	-
SS4A	2198	1751	447	1752	446	1751	447	1750	448	1745	453
SS4B	1920	1675	245	1671	249	1667	253	1662	258	1644	276
SS4C	2591	1503	1088	1497	1094	1495	1096	1490	1101	1473	1118
SS4D	2630	-	-	-	-	-	-	-	-	-	-
SS5A	1881	1888	-7	1893	-12	1893	-12	1893	-12	1890	-9
SS5B	2075	1780	295	1776	299	1774	301	1771	304	1750	325
SS5C	1938	-	-	-	-	-	-	-	-	-	-
SS5D	1858	1871	-13	1870	-12	1869	-11	1868	-10	1867	-9
SS6A	1982	2203	-221	2203	-221	2200	-218	2197	-215	2189	-207
SS6B	1842	1628	214	1625	217	1624	218	1621	221	1610	232
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-

Comments: Datum

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 10

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	9.08	22.35	10.08	.45	10.08	5.20	10.08	21.14	10.08	23.35
Tunnel ch.	1835.90	1938.50		1940.50		1945.20		1953.70		1955.50	
SS1A	1881	1880	1	1881	0	1881	0	1881	0	1882	-1
SS1B	2130	2018	112	2104	26	2103	27	2100	30	2100	30
SS1C	2085	1713	372	1709	376	1706	379	1704	381	1705	380
SS1D	2095	1989	106	1985	110	1983	112	1979	116	1980	115
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1548	596	1548	596	1546	598	1541	603	1541	603
SS2D	2484	1638	846	1636	848	1636	848	1629	855	1628	856
SS3A	1950	1833	117	1832	118	1829	121	1821	129	1821	129
SS3B	2126	1881	245	1880	246	1878	248	1872	254	1870	256
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	-	-	-	-
SS4A	2198	1745	453	1750	448	1745	453	1741	457	1739	459
SS4B	1920	1642	278	1646	274	1639	281	1624	296	1624	296
SS4C	2591	1472	1119	1497	1094	1485	1106	1466	1125	1464	1127
SS4D	2630	-	-	-	-	-	-	-	-	-	-
SS5A	1881	1888	-7	1883	-2	1883	-2	1878	3	1880	1
SS5B	2075	1753	322	1786	289	1780	295	1784	291	1784	291
SS5C	1938	-	-	1771	167	-	-	-	-	-	-
SS5D	1858	1868	-10	1866	-8	1866	-8	1868	-10	1869	-11
SS6A	1982	2190	-208	2188	-206	2187	-205	2185	-203	2186	-204
SS6B	1842	1610	232	1611	231	1607	235	1604	238	1602	240
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 11

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	11.08	1.00	11.08	6.00	13.08	10.45	14.08	11.00	15.08	10.45
Tunnel ch.	1835.90	1956.50		1960.30		1960.97		1973.59		1991.07	
SS1A	1881	1882	-1	1882	-1	1880	1	1878	3	1878	3
SS1B	2130	2098	32	2097	33	2076	54	2067	63	2058	72
SS1C	2085	1703	382	1702	383	1686	399	1675	410	1670	415
SS1D	2095	1978	117	1975	120	1957	138	1953	142	1951	144
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1540	604	1539	605	1528	616	1528	616	1525	619
SS2D	2484	1628	856	1625	859	1604	880	1597	887	1590	894
SS3A	1950	1820	130	1816	134	1805	145	1807	143	1804	146
SS3B	2126	1870	256	1868	258	1849	277	1845	281	1842	284
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	-	-	-	-	-	-	-	-	-	-	-
SS4A	2198	1741	457	1736	462	1720	478	1720	478	1718	480
SS4B	1920	1626	294	1616	304	1570	350	1555	365	1540	380
SS4C	2591	1465	1126	1461	1130	1412	1179	1402	1189	1393	1198
SS4D	2630	-	-	-	-	-	-	2923	-293	-	-
SS5A	1881	1881	0	1881	0	1876	5	1879	2	1881	0
SS5B	2075	1784	291	1778	297	1760	315	1756	319	1745	330
SS5C	1938	-	-	-	-	1679	259	1675	263	1666	272
SS5D	1858	1869	-11	1870	-12	1870	-12	1870	-12	1870	-12
SS6A	1982	2184	-202	2183	-201	2169	-187	2166	-184	2160	-178
SS6B	1842	1601	241	1600	242	1576	266	1573	269	1562	280
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
						No load		No load		No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 12

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	16.08	13.30	17.08	12.15	27.08	15.00	17.09	14.00	20.02	12.00
Tunnel ch.	1835.90	1997.47		2003.37		2086.10		2351.50		3579.78	1985
SS1A	1881	1878	3	1879	2	1880	1	1876	5	1885	-4
SS1B	2130	2057	73	2045	85	2011	119	1984	146	1939	191
SS1C	2085	1669	416	1661	424	1623	462	1607	478	1592	493
SS1D	2095	1951	144	1926	169	1908	187	1883	212	1807	288
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1525	619	1520	624	1506	638	1489	655	1442	702
SS2D	2484	1589	895	1578	906	1545	939	1523	961	1453	1031
SS3A	1950	1803	147	1795	155	1769	181	1814	136	1732	218
SS3B	2126	1841	285	1831	295	1787	339	1872	254	1787	339
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	2483	2483	0	2485	-2	2433	50	2417	66	-	-
SS4A	2198	1718	457	1707	462	1675	478	1641	478	1545	480
SS4B	1920	1539	294	1507	304	1408	350	1272	365	955	380
SS4C	2591	1391	1126	1363	1130	1302	1179	1255	1189	-	-
SS4D	2630	-	-	2871	-241	2780	-150	2655	-293	2368	262
SS5A	1881	1881	0	1867	0	1855	5	1832	2	1770	0
SS5B	2075	1746	291	1728	297	1693	315	1644	319	1541	330
SS5C	1938	1665	273	1659	279	1603	259	1577	263	1443	272
SS5D	1858	1870	-11	-	-	1858	-12	1849	-12	1850	-12
SS6A	1982	2161	-202	2153	-201	2118	-187	2093	-184	2011	-178
SS6B	1842	1562	241	1548	242	1517	266	1474	269	1315	280
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
				No load		No load				No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 12

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	1.08	16.08	13.30	17.08	12.15	27.08	15.00	17.09	14.00	20.02	12.00
Tunnel ch.	1835.90	1997.47		2003.37		2086.10		2351.50		3579.78	1985
SS1A	1881	1878	3	1879	2	1880	1	1876	5	1885	-4
SS1B	2130	2057	73	2045	85	2011	119	1984	146	1939	191
SS1C	2085	1669	416	1661	424	1623	462	1607	478	1592	493
SS1D	2095	1951	144	1926	169	1908	187	1883	212	1807	288
SS2A	2077	-	-	-	-	-	-	-	-	-	-
SS2B	-	-	-	-	-	-	-	-	-	-	-
SS2C	2144	1525	619	1520	624	1506	638	1489	655	1442	702
SS2D	2484	1589	895	1578	906	1545	939	1523	961	1453	1031
SS3A	1950	1803	147	1795	155	1769	181	1814	136	1732	218
SS3B	2126	1841	285	1831	295	1787	339	1872	254	1787	339
SS3C	-	-	-	-	-	-	-	-	-	-	-
SS3D	2483	2483	0	2485	-2	2433	50	2417	66	-	-
SS4A	2198	1718	480	1707	491	1675	523	1641	557	1545	653
SS4B	1920	1539	381	1507	413	1408	512	1272	648	955	965
SS4C	2591	1391	1200	1363	1228	1302	1289	1255	1336	-	-
SS4D	2630	-	-	2871	-241	2780	-150	2655	-25	2368	262
SS5A	1881	1881	0	1867	14	1855	26	1832	49	1770	111
SS5B	2075	1746	329	1728	347	1693	382	1644	431	1541	534
SS5C	1938	1665	273	1659	279	1603	335	1577	361	1443	495
SS5D	1858	1870	-12	-	-	1858	0	1849	9	1850	8
SS6A	1982	2161	-179	2153	-171	2118	-136	2093	-111	2011	-29
SS6B	1842	1562	280	1548	294	1517	325	1474	368	1315	527
SS6C	-	-	-	-	-	-	-	-	-	-	-
SS6D	-	-	-	-	-	-	-	-	-	-	-
Comments	Datum			No load		No load				No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	2.12	16.45	2.12	17.10	2.12	17.55	2.12	18.25	2.12	18.46
Tunnel ch.	3358.45	3358.45		3385.50		3359.80		3360.00		3360.00	
SS1A	1894	1894	0	1899	-5	1912	-18	1988	-94	2187	-293
SS1B	1750	1750	0	1678	72	1720	30	1694	56	1616	134
SS1C	1307	1307	0	1227	80	1363	-56	1315	-8	1095	212
SS1D	2019	2019	0	2017	2	2002	17	2042	-23	2130	-111
SS2A	2064	2064	0	2585	-521	2057	7	2194	-130	1950	114
SS2B	2013	2013	0	3178	-1165	2222	-209	2253	-240	-	-
SS2C	1824	1824	0	2283	-459	1902	-78	1995	-171	-	-
SS2D	1950	1950	0	2500	-550	2193	-243	2202	-252	-	-
SS3A	1897	1897	0	2108	-211	1922	-25	1868	29	-	-
SS3B	2109	2109	0	2431	-322	2137	-28	2315	-206	-	-
SS3C	2049	2049	0	3472	-1423	1912	137	1901	148	-	-
SS3D	3454	3454	0	4768	-1314	3730	-276	3850	-396	-	-
SS4A	1947	1947	0	2025	-78	1892	55	2018	-71	-	-
SS4B	1944	1944	0	1789	155	1884	60	2010	-66	-	-
SS4C	1700	1700	0	1609	91	1620	80	1760	-60	-	-
SS4D	2208	2208	0	2181	27	2247	-39	2319	-111	-	-
SS5A	1770	1770	0	1631	139	1850	-80	1777	-7	-	-
SS5B	4163	4163	0	6222	-2059	4515	-352	4546	-383	-	-
SS5C	2162	2162	0	2502	-340	2186	-24	2128	34	-	-
SS5D	1883	1883	0	2193	-310	1944	-61	2107	-224	-	-
SS6A	2091	2091	0	2339	-248	2112	-21	2199	-108	-	-
SS6B	1918	1918	0	2241	-323	1846	72	1907	11	-	-
SS6C	1897	1897	0	2968	-1071	2549	-652	2687	-790	-	-
SS6D	3800	3800	0	-	-	4328	-528	4339	-539	-	-
Comments	Datum	No load				No load				Expanding ring, part set of readings	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	2.12	18.50	2.12	19.13	2.12	20.00	2.12	20.40	2.12	21.45
Tunnel ch.	3358.45	3360.60		3361.00		3361.00		3361.00		3361.00	
SS1A	1894	1952	-58	1898	-4	1911	-17	1921	-27	1930	-36
SS1B	1750	1596	154	1625	125	1636	114	1641	109	1649	101
SS1C	1307	1111	196	1089	218	1099	208	1112	195	1130	177
SS1D	2019	2001	18	2044	-25	2055	-36	2058	-39	2061	-42
SS2A	2064	1945	119	1972	92	1980	84	1981	83	1982	82
SS2B	2013	2165	-152	2183	-170	2196	-183	2206	-193	2212	-199
SS2C	1824	1867	-43	1869	-45	1856	-32	1856	-32	1859	-35
SS2D	1950	2139	-189	2153	-203	2161	-211	2166	-216	2171	-221
SS3A	1897	1825	72	1832	65	1845	52	1855	42	1865	32
SS3B	2109	2193	-84	2184	-75	2144	-35	2138	-29	2140	-31
SS3C	2049	1866	183	1860	189	1846	203	1838	211	1829	220
SS3D	3454	3668	-214	3666	-212	3651	-197	3648	-194	3639	-185
SS4A	1947	1958	-11	1950	-3	1939	8	1934	13	1931	16
SS4B	1944	1904	40	1898	46	1886	58	1889	55	1902	42
SS4C	1700	1563	137	1545	155	1537	163	1534	166	1539	161
SS4D	2208	2403	-195	2405	-197	2403	-195	2408	-200	2425	-217
SS5A	1770	1791	-21	1786	-16	1771	-1	1768	2	1761	9
SS5B	4163	4466	-303	4500	-337	4494	-331	4494	-331	4482	-319
SS5C	2162	2095	67	2115	47	2117	45	2118	44	2116	46
SS5D	1883	1937	-54	1918	-35	1930	-47	1939	-56	1952	-69
SS6A	2091	2062	29	2050	41	2044	47	2050	41	2058	33
SS6B	1918	1749	169	1788	130	1800	118	1806	112	1808	110
SS6C	1897	2394	-497	2406	-509	2408	-511	2412	-515	2414	-517
SS6D	3800	-	-	4311	-511	4316	-516	4316	-516	4302	-502
				No load		No load		No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	2.12	23.00	3.12	.30	3.12	1.00	3.12	5.30	3.12	10.20
Tunnel ch.	3358.45	3362.00		3364.00		3365.00		3365.00		3369.25	
SS1A	1894	2040	-146	1954	-60	1946	-52	1740	154	1660	234
SS1B	1750	1646	104	1553	197	1559	191	1426	324	1392	358
SS1C	1307	1164	143	927	380	883	424	-	-	-	-
SS1D	2019	2060	-41	2058	-39	2082	-63	2002	17	1914	105
SS2A	2064	2002	62	1989	75	1997	67	1988	76	1971	93
SS2B	2013	2213	-200	2117	-104	2106	-93	1898	115	1812	201
SS2C	1824	1823	1	1787	37	1765	59	1684	140	1632	192
SS2D	1950	2183	-233	2129	-179	2105	-155	2029	-79	1975	-25
SS3A	1897	1857	40	1840	57	1814	83	1775	122	1728	169
SS3B	2109	2086	23	2031	78	2017	92	1893	216	1817	292
SS3C	2049	1779	270	1752	297	1761	288	1632	417	1625	424
SS3D	3454	3655	-201	3633	-179	-	-	-	-	-	-
SS4A	1947	1898	49	1859	88	1802	145	1885	62	1853	94
SS4B	1944	1859	85	1844	100	1850	94	1601	343	1691	253
SS4C	1700	1350	350	1358	342	1642	58	1251	449	1332	368
SS4D	2208	2454	-246	2518	-310	2720	-512	2760	-552	2781	-573
SS5A	1770	-	-	-	-	1736	34	1770	0	1768	2
SS5B	4163	4339	-176	-	-	-	-	-	-	-	-
SS5C	2162	2043	119	1878	284	1847	315	1626	536	1706	456
SS5D	1883	2041	-158	2057	-174	2024	-141	1907	-24	1961	-78
SS6A	2091	2113	-22	2058	33	2045	46	1973	118	2008	83
SS6B	1918	1825	93	1747	171	1684	234	1474	444	1560	358
SS6C	1897	2442	-545	2340	-443	2328	-431	2197	-300	-	-
SS6D	3800	4299	-499	4243	-443	-	-	-	-	-	-
						No load		No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 4

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	3.12	11.20	3.12	17.00	3.12	18.00	3.12	19.00	3.12	21.15
Tunnel ch.	3358.45	3372.45		3374.95		3376.45		3377.95		3380.65	
SS1A	1894	1620	274	1524	370	1524	370	1500	394	1432	462
SS1B	1750	1364	386	1312	438	1315	435	1290	460	1247	503
SS1C	1307	-	-	-	-	-	-	-	-	-	-
SS1D	2019	1874	145	1694	325	1673	346	1670	349	1597	422
SS2A	2064	1961	103	1929	135	1936	128	1936	128	1923	141
SS2B	2013	1780	233	1661	352	1659	354	1636	377	1583	430
SS2C	1824	1607	217	1530	294	1518	306	1499	325	1468	356
SS2D	1950	1937	13	1865	85	1856	94	1832	118	1800	150
SS3A	1897	1729	168	1664	233	1661	236	1657	240	1653	244
SS3B	2109	1803	306	1722	387	1716	393	1713	396	1705	404
SS3C	2049	1623	426	1611	438	1606	443	1600	449	1584	465
SS3D	3454	-	-	-	-	-	-	-	-	-	-
SS4A	1947	1888	59	1861	86	1854	93	1858	89	1866	81
SS4B	1944	1552	392	1448	496	1420	524	1408	536	1348	596
SS4C	1700	1012	688	932	768	868	832	860	840	702	998
SS4D	2208	2659	-451	2527	-319	2528	-320	2570	-362	2590	-382
SS5A	1770	1780	-10	1768	2	1791	-21	1791	-21	1742	28
SS5B	4163	-	-	-	-	-	-	-	-	-	-
SS5C	2162	1607	555	1516	646	1490	672	1458	704	1450	712
SS5D	1883	1898	-15	1800	83	1783	100	1751	132	1741	142
SS6A	2091	1971	120	1905	186	1901	190	1903	188	1877	214
SS6B	1918	1455	463	1314	604	1299	619	1290	628	1249	669
SS6C	1897	2190	-293	2178	-281	2183	-286	2162	-265	2139	-242
SS6D	3800	-	-	-	-	-	-	-	-	-	-
				No load		No load		No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	3.12	22.00	3.12	23.05	4.12	.40	4.12	2.30	4.12	5.00
Tunnel ch.	3358.45	3382.15		3383.65		3383.65		3386.65		3388.15	
SS1A	1894	1407	487	1376	518	1352	542	1318	576	1275	619
SS1B	1750	1228	522	1206	544	1189	561	1169	581	1140	610
SS1C	1307	-	-	-	-	-	-	-	-	-	-
SS1D	2019	1561	458	1510	509	1465	554	1407	612	1333	686
SS2A	2064	1917	147	1903	161	1898	166	1883	181	1874	190
SS2B	2013	1565	448	1540	473	1519	494	1484	529	1458	555
SS2C	1824	1458	366	1446	378	1441	383	1412	412	1407	417
SS2D	1950	1790	160	1779	171	1774	176	1744	206	1742	208
SS3A	1897	1648	249	1641	256	1644	253	1620	277	1614	283
SS3B	2109	1698	411	1688	421	1689	420	1662	447	1655	454
SS3C	2049	1585	464	1585	464	1578	471	1575	474	1575	474
SS3D	3454	-	-	-	-	-	-	-	-	-	-
SS4A	1947	1860	87	1857	90	1865	82	1851	96	1851	96
SS4B	1944	1347	597	1322	622	1303	641	1258	686	1206	738
SS4C	1700	722	978	718	982	742	958	669	1031	654	1046
SS4D	2208	2455	-247	2438	-230	2468	-260	2405	-197	2419	-211
SS5A	1770	1764	6	1769	1	1764	6	1776	-6	1772	-2
SS5B	4163	-	-	-	-	-	-	-	-	-	-
SS5C	2162	1446	716	1442	720	1440	722	1422	740	1415	747
SS5D	1883	1741	142	1736	147	1732	151	1710	173	1707	176
SS6A	2091	1867	224	1860	231	1851	240	1855	236	1842	249
SS6B	1918	1234	684	1221	697	1209	709	1203	715	1183	735
SS6C	1897	2125	-228	2113	-216	2105	-208	2097	-200	2075	-178
SS6D	3800	-	-	-	-	-	-	-	-	-	-
								No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	4.12	12.45	4.12	15.27	4.12	16.40	4.12	18.40	4.12	19.45
Tunnel ch.	3358.45	3392.65		3395.65		3397.15		3398.65		3399.00	
SS1A	1894	1171	723	1134	760	1124	770	-	-	1113	781
SS1B	1750	1078	672	1057	693	1053	697	1048	702	1045	705
SS1C	1307	-	-	-	-	-	-	-	-	-	-
SS1D	2019	1182	837	1123	896	1114	905	1108	911	1103	916
SS2A	2064	1874	190	1886	178	-	-	-	-	-	-
SS2B	2013	1418	595	1412	601	-	-	-	-	-	-
SS2C	1824	1365	459	1350	474	1342	482	1335	489	1333	491
SS2D	1950	1699	251	1686	264	1680	270	1674	276	1671	279
SS3A	1897	1566	331	1560	337	1559	338	1555	342	1554	343
SS3B	2109	1561	548	1545	564	1539	570	1533	576	1532	577
SS3C	2049	1566	483	1581	468	1578	471	1572	477	1587	462
SS3D	3454	-	-	3270	184	3263	191	3252	202	3246	208
SS4A	1947	1809	138	1798	149	1793	154	1784	163	1779	168
SS4B	1944	1065	879	1024	920	1011	933	990	954	976	968
SS4C	1700	593	1107	571	1129	548	1152	-	-	-	-
SS4D	2208	2255	-47	2287	-79	2276	-68	2272	-64	2270	-62
SS5A	1770	1803	-33	1806	-36	1799	-29	1794	-24	1795	-25
SS5B	4163	-	-	-	-	3833	330	3831	332	3829	334
SS5C	2162	1389	773	1371	791	1368	794	1365	797	1363	799
SS5D	1883	1672	211	1645	238	1643	240	1642	241	1639	244
SS6A	2091	1813	278	1800	291	1799	292	1796	295	1794	297
SS6B	1918	1128	790	1099	819	1096	822	1100	818	1099	819
SS6C	1897	-	-	2021	-124	2022	-125	2036	-139	-	-
SS6D	3800	-	-	-	-	-	-	-	-	3730	70
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

Instrument Section Steel Sets — Chainage 3353 a
Date installed 01/12/84 — Tunnel No. 2 — Sheet 7

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	4.12	21.30	4.12	22.40	5.12	.30	5.12	3.00	5.12	7.30
Tunnel ch.	3358.45	3399.50		3401.15		3403.15		3404.65		3409.15	
SS1A	1894	1098	796	1081	813	1061	833	1041	853	999	895
SS1B	1750	1035	715	-	-	1020	730	1010	740	987	763
SS1C	1307	-	-	-	-	-	-	-	-	-	-
SS1D	2019	1081	938	1054	965	1027	992	1001	1018	937	1082
SS2A	2064	-	-	-	-	1841	223	1871	193	1835	229
SS2B	2013	-	-	-	-	1379	634	1370	643	1347	666
SS2C	1824	1325	499	1317	507	1309	515	1300	524	1281	543
SS2D	1950	1661	289	1649	301	1643	307	1634	316	1615	335
SS3A	1897	1549	348	1542	355	1532	365	1525	372	1513	384
SS3B	2109	1524	585	1516	593	1504	605	1496	613	1479	630
SS3C	2049	1585	464	1584	465	1580	469	1578	471	1573	476
SS3D	3454	3240	214	3231	223	3224	230	3213	241	3194	260
SS4A	1947	1772	175	1766	181	1753	194	1743	204	1722	225
SS4B	1944	959	985	940	1004	906	1038	882	1062	841	1103
SS4C	1700	-	-	-	-	-	-	-	-	-	-
SS4D	2208	2255	-47	2246	-38	2231	-23	2215	-7	2182	26
SS5A	1770	1793	-23	1772	-2	1781	-11	1790	-20	1793	-23
SS5B	4163	3821	342	3793	370	3812	351	3807	356	3800	363
SS5C	2162	1358	804	1352	810	1341	821	1334	828	1319	843
SS5D	1883	1630	253	1632	251	1607	276	1596	287	1580	303
SS6A	2091	1787	304	1783	308	1778	313	1773	318	1763	328
SS6B	1918	1088	830	1077	841	1063	855	1055	863	1031	887
SS6C	1897	-	-	2021	-124	2011	-114	2009	-112	1997	-100
SS6D	3800	3723	77	3712	88	3700	100	3693	107	3673	127
						No load					
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRAIN GAUGE DATA

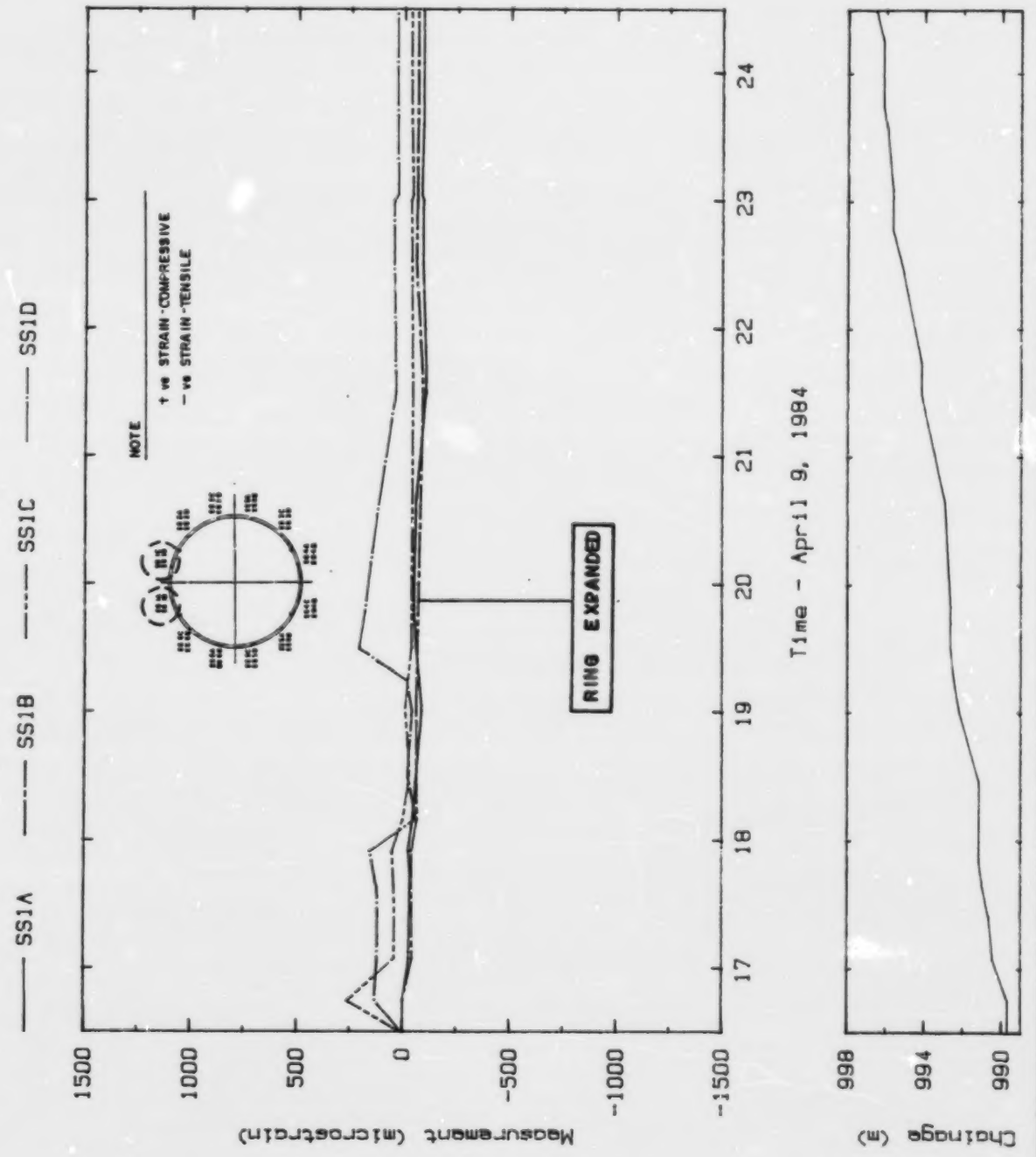
Instrument Section Steel Sets — Chainage 3353 e
Date installed 01/12/84 — Tunnel No. 2 — Sheet 8

	Reading	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.	Reading	Diff.
Date/Time	2.12	10.12	9.50	13.12	11.30	17.12	19.00	19.12	9.30	20.02	12.00
Tunnel ch.	3358.45	3457.76		3516.66		3549.53		3575.03		3579.78	1985
SS1A	1894	638	1256	567	1327	481	1413	-	-	-	-
SS1B	1750	828	922	872	878	812	938	-	-	-	-
SS1C	1307	-	-	-	-	-	1307	-	-	-	-
SS1D	2019	-	-	1461	558	1995	24	-	-	-	-
SS2A	2064	1781	283	1797	267	1762	302	1765	299	1250	814
SS2B	2013	1132	881	1261	752	1193	820	-	-	-	-
SS2C	1824	1212	612	1335	489	1313	511	1318	506	1196	628
SS2D	1950	1507	443	1526	424	1526	424	1595	355	1536	414
SS3A	1897	1339	558	1263	634	1224	673	1221	676	1046	851
SS3B	2109	1268	841	1184	925	1140	969	1138	971	926	1183
SS3C	2049	1506	543	1482	567	1489	560	1494	555	1475	574
SS3D	3454	2975	479	2893	561	2871	583	2869	585	2727	727
SS4A	1947	1512	435	1445	502	1390	557	-	-	-	-
SS4B	1944	495	1449	431	1513	413	1531	3624	-1680	-	-
SS4C	1700	-	-	-	-	-	-	-	-	1990	-290
SS4D	2208	1972	236	1907	301	1835	373	1808	400	1336	872
SS5A	1770	1810	-40	-	-	-	-	-	-	1885	-115
SS5B	4163	3723	440	3779	384	3774	389	3781	382	3700	463
SS5C	2162	1182	980	1132	1030	1117	1045	1118	1044	996	1166
SS5D	1883	1403	480	1319	564	1288	595	1289	594	1057	826
SS6A	2091	1663	428	1650	441	1636	455	1644	447	1530	561
SS6B	1918	811	1107	717	1201	683	1235	688	1230	-	-
SS6C	1897	1972	-75	1925	-28	1901	-4	-	-	1793	104
SS6D	3800	3529	271	3464	336	3431	369	3433	367	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

STEEL SET STRAIN MEASUREMENTS
Steel Set #1 - Crown - ch. 984m

FIGURE C.99



Date November 1984
Project No. 831-6014

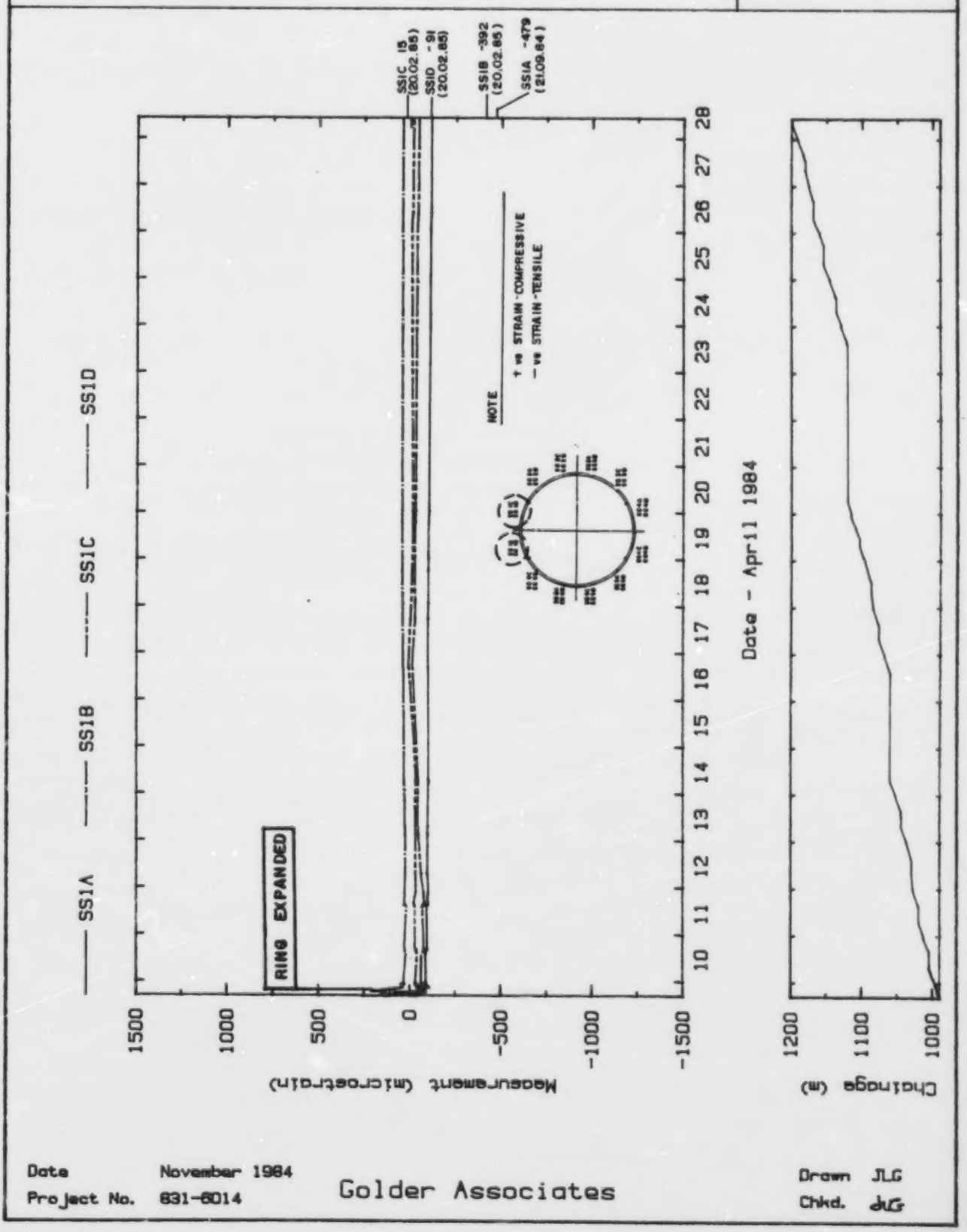
Golder Associates

Drawn JLG
Chkd. [illegible]

STEEL SET STRAIN MEASUREMENTS

Steel Set #1 - Crown - ch. 984m

FIGURE C.100



Date November 1984

Project No. 831-6014

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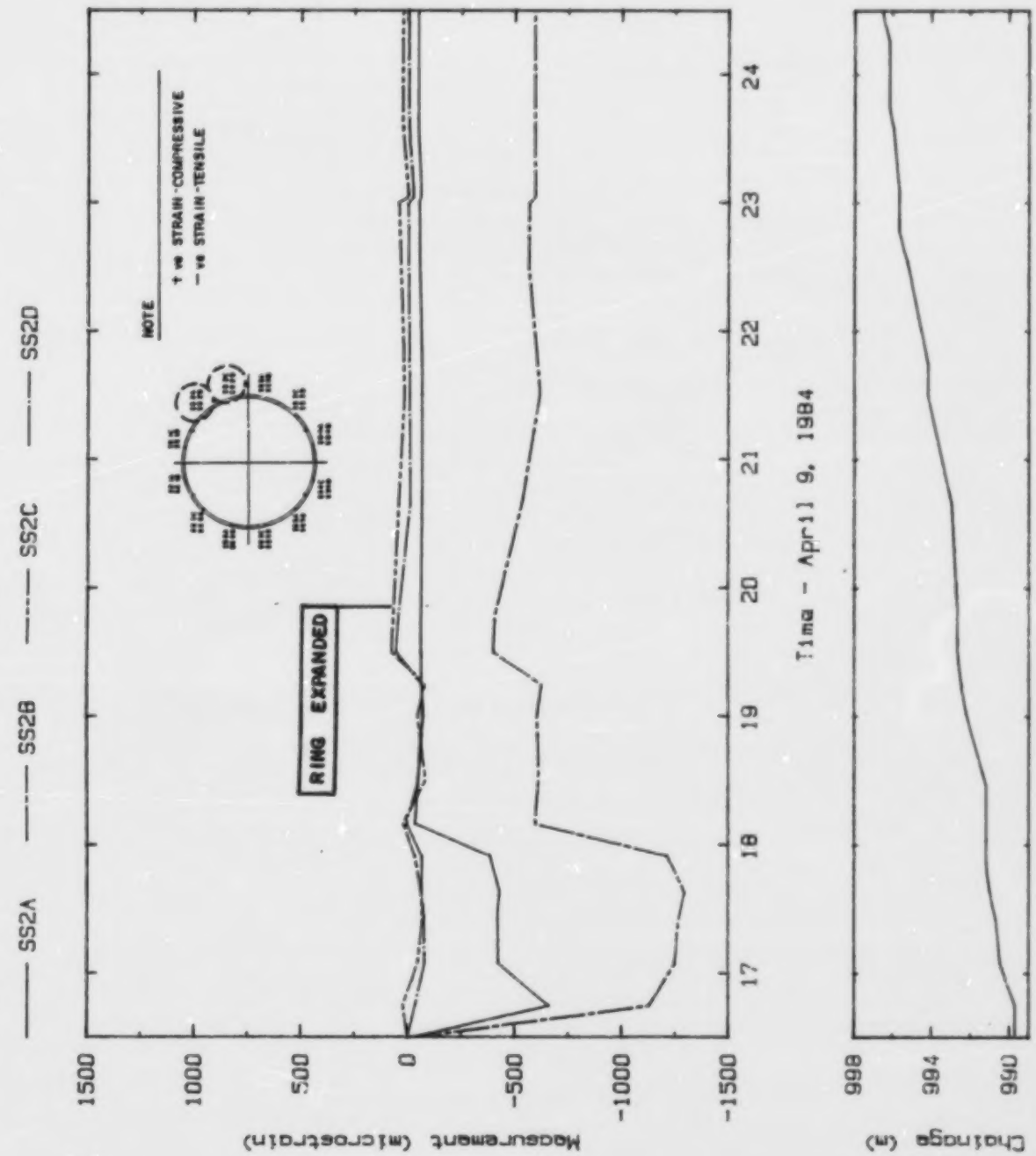
Drawn JLG

Chkd. dJG

STEEL SET STRAIN MEASUREMENTS

Steel Set #2 - East upper side - ch. 984m

FIGURE C.101



Date November 1984

Project No. 831-6014

Golder Associates

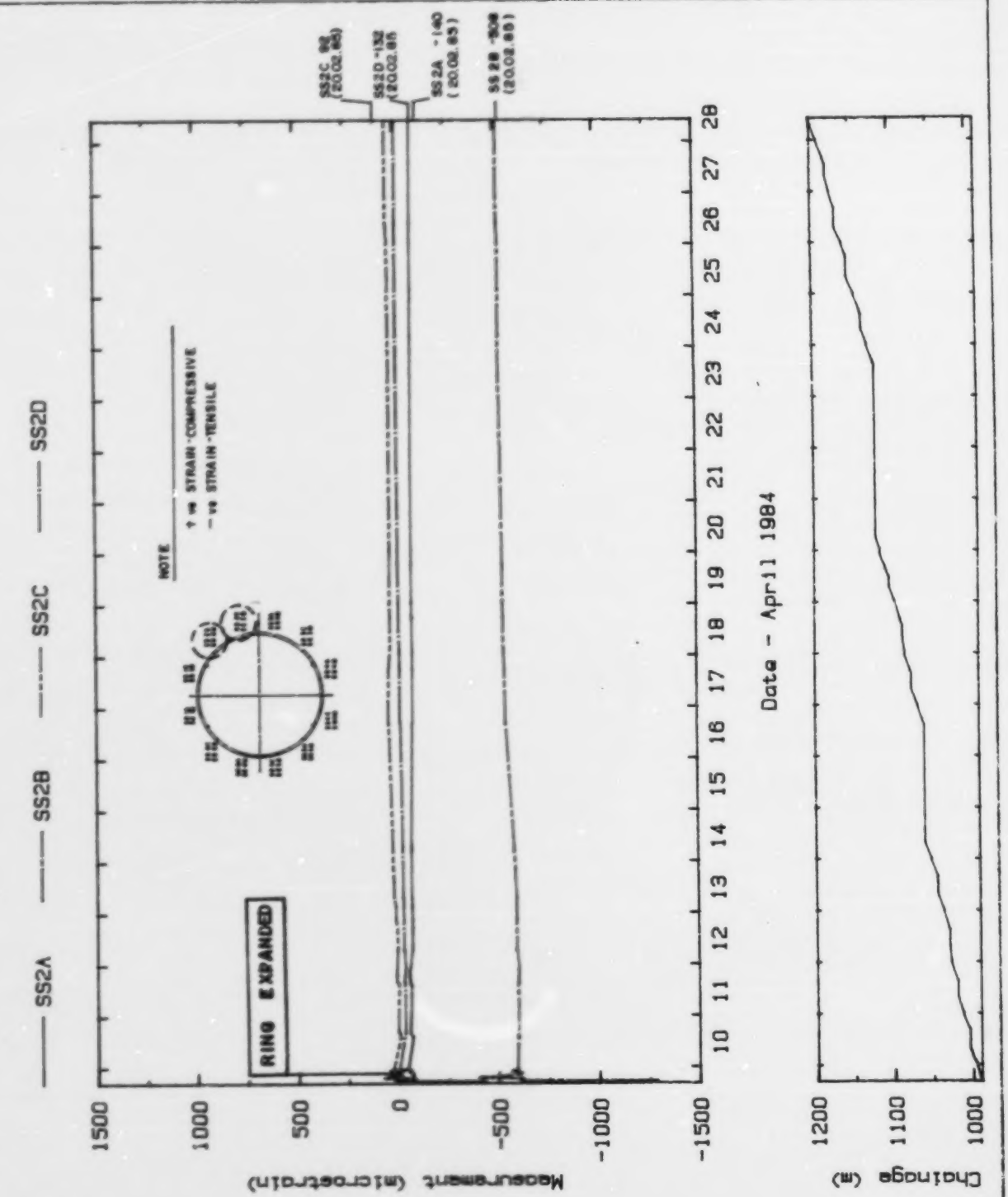
Drawn JLG

Chkd. JJF

STEEL SET STRAIN MEASUREMENTS

Steel Set #2 - East upper side - ch. 984m

FIGURE C.102



Date November 1984

Project No. 831-6014

Golder Associates

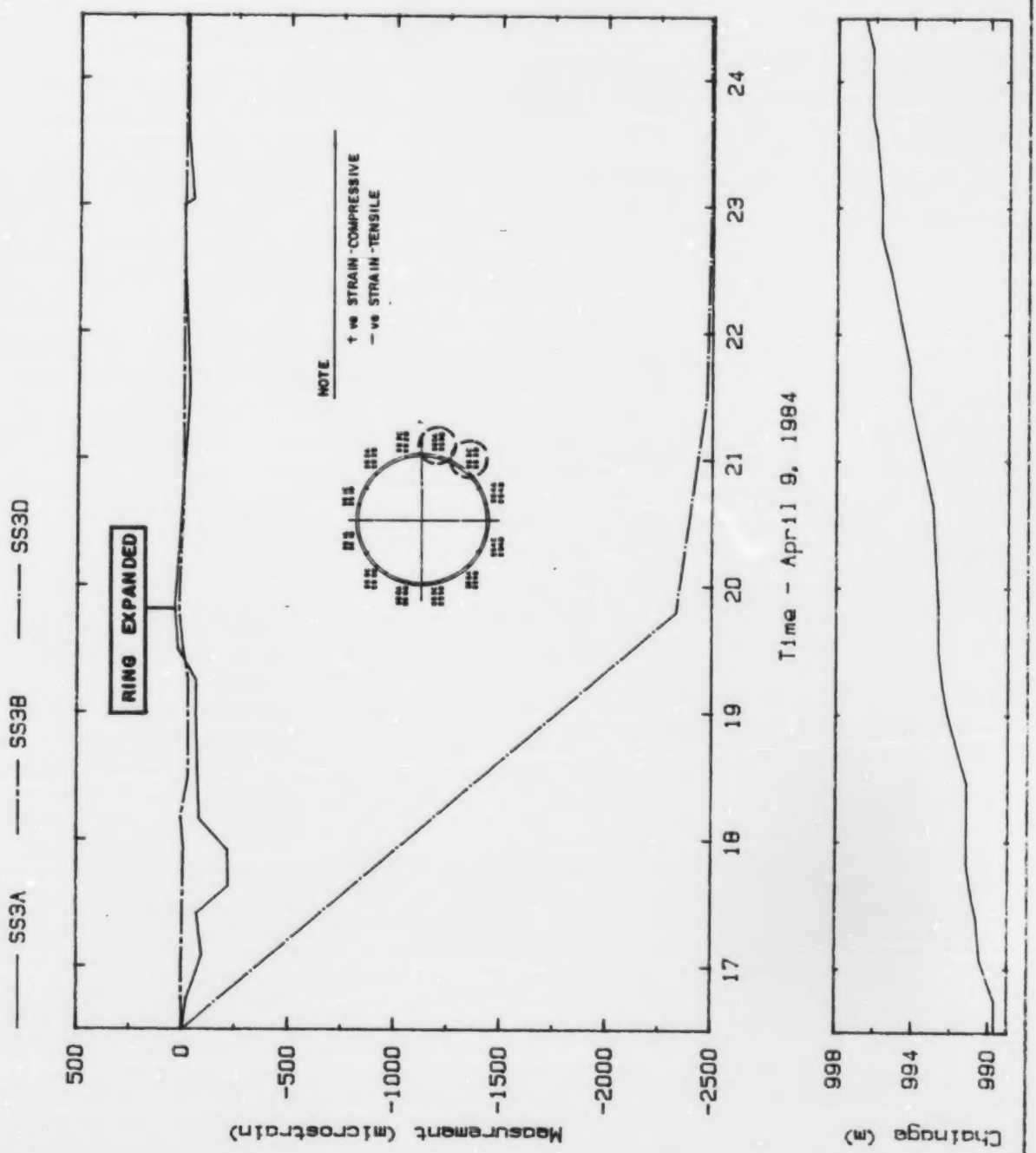
Drawn JLG

Chkd.

STEEL SET STRAIN MEASUREMENTS

Steel Set #3 - East lower side - ch. 984m

FIGURE C.103



Data November 1984

Project No. 831-6014

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Drawn JLG

Chkd. dJG

STEEL SET STRAIN MEASUREMENTS

Steel Set #3 - East lower side - ch. 984m

FIGURE C.104

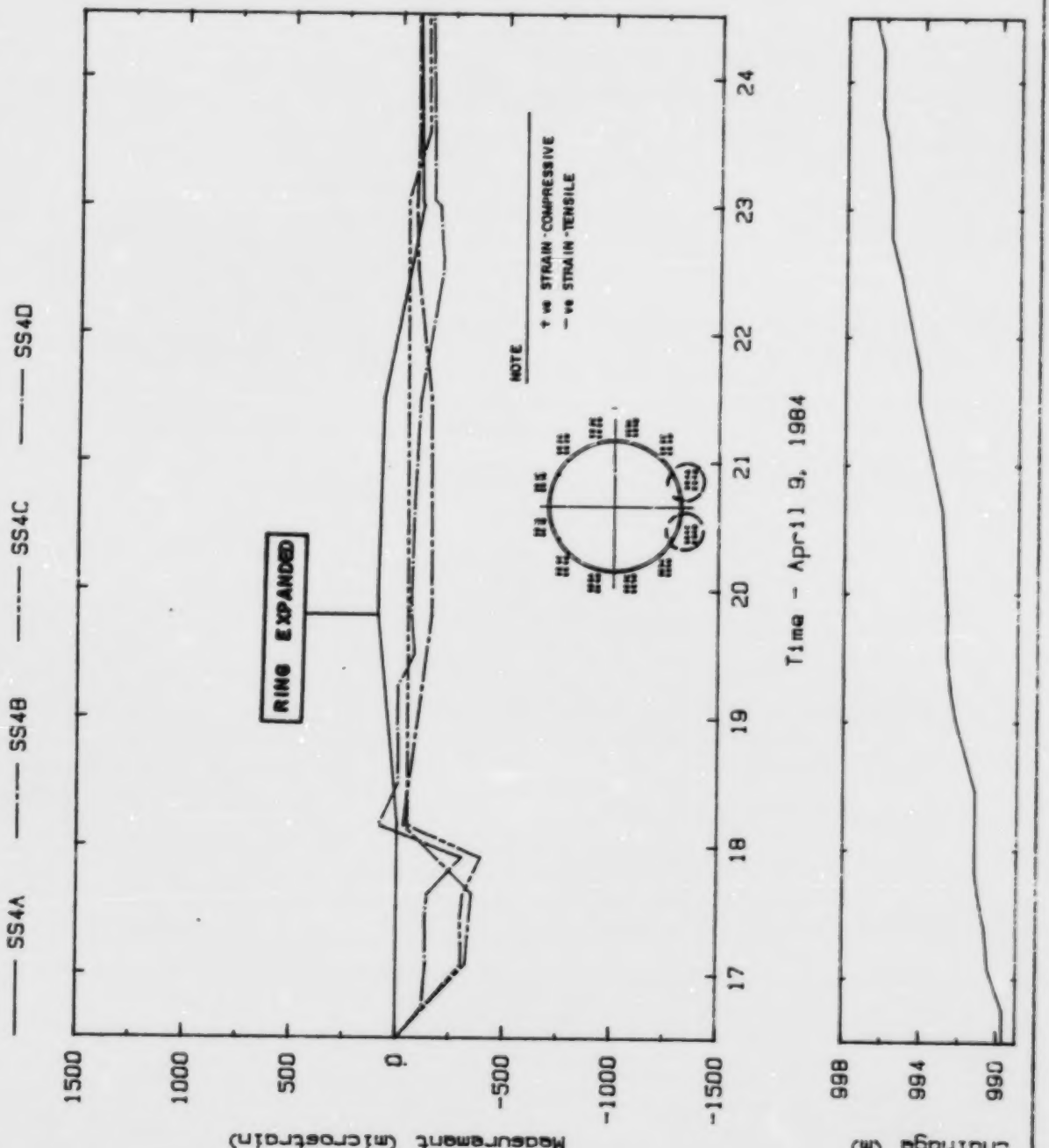
Date November 1984
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd. dlr

STEEL SET STRAIN MEASUREMENTS
Steel Set #4 - Invert - ch. 984m

FIGURE C.105



Date November 1984
Project No. 831-6014

Golder Associates

Drawn JLC
Chkd. dvG

STEEL SET STRAIN MEASUREMENTS

Steel Set #4 - Invert - ch. 984m

FIGURE C.106

Date November 1984

Project No. 831-6014

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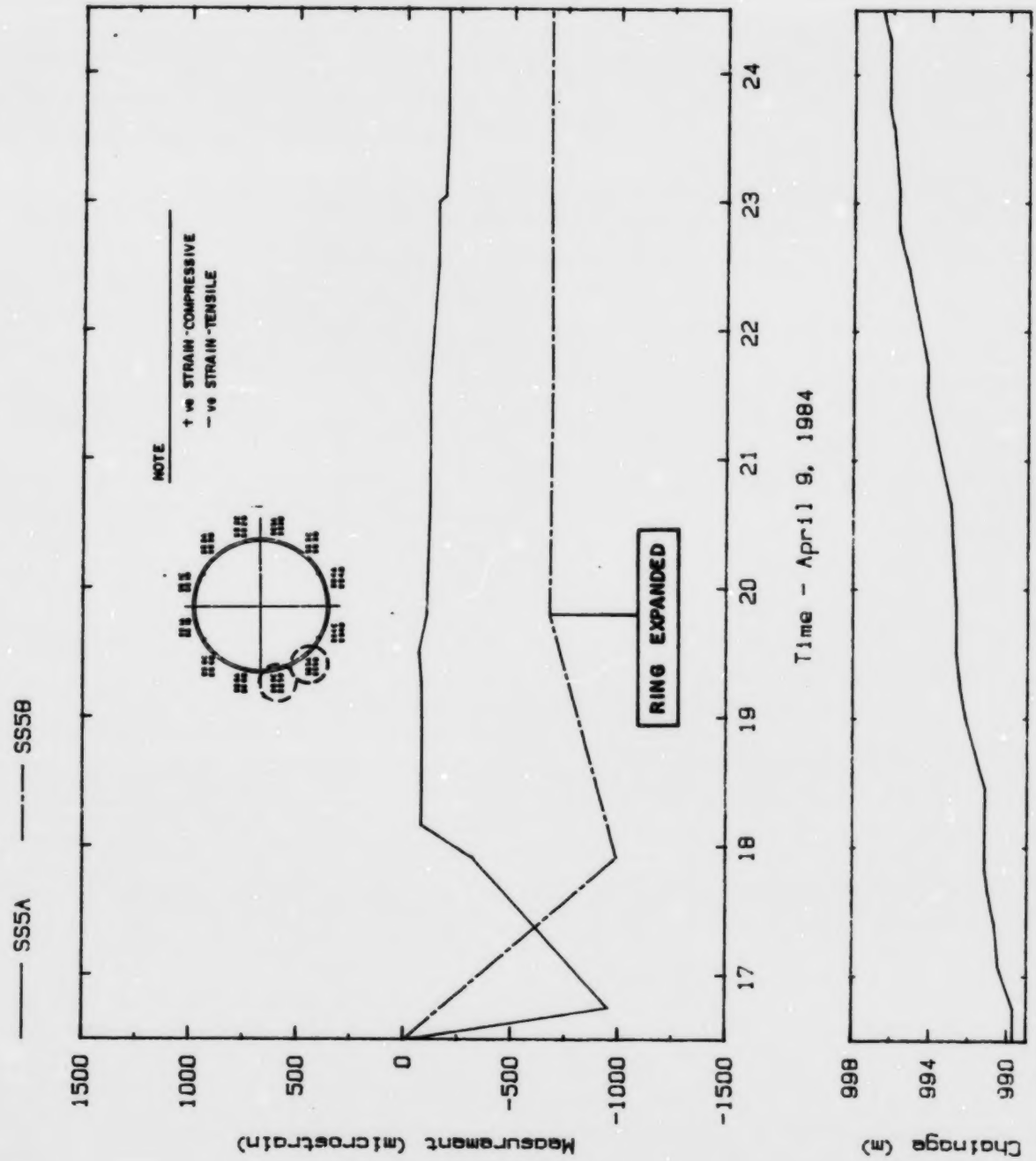
Drawn JLG

Chkd. dhG

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - West lower side - ch. 984m

FIGURE C.107



Date November 1984

Project No. 831-6014

Golder Associates

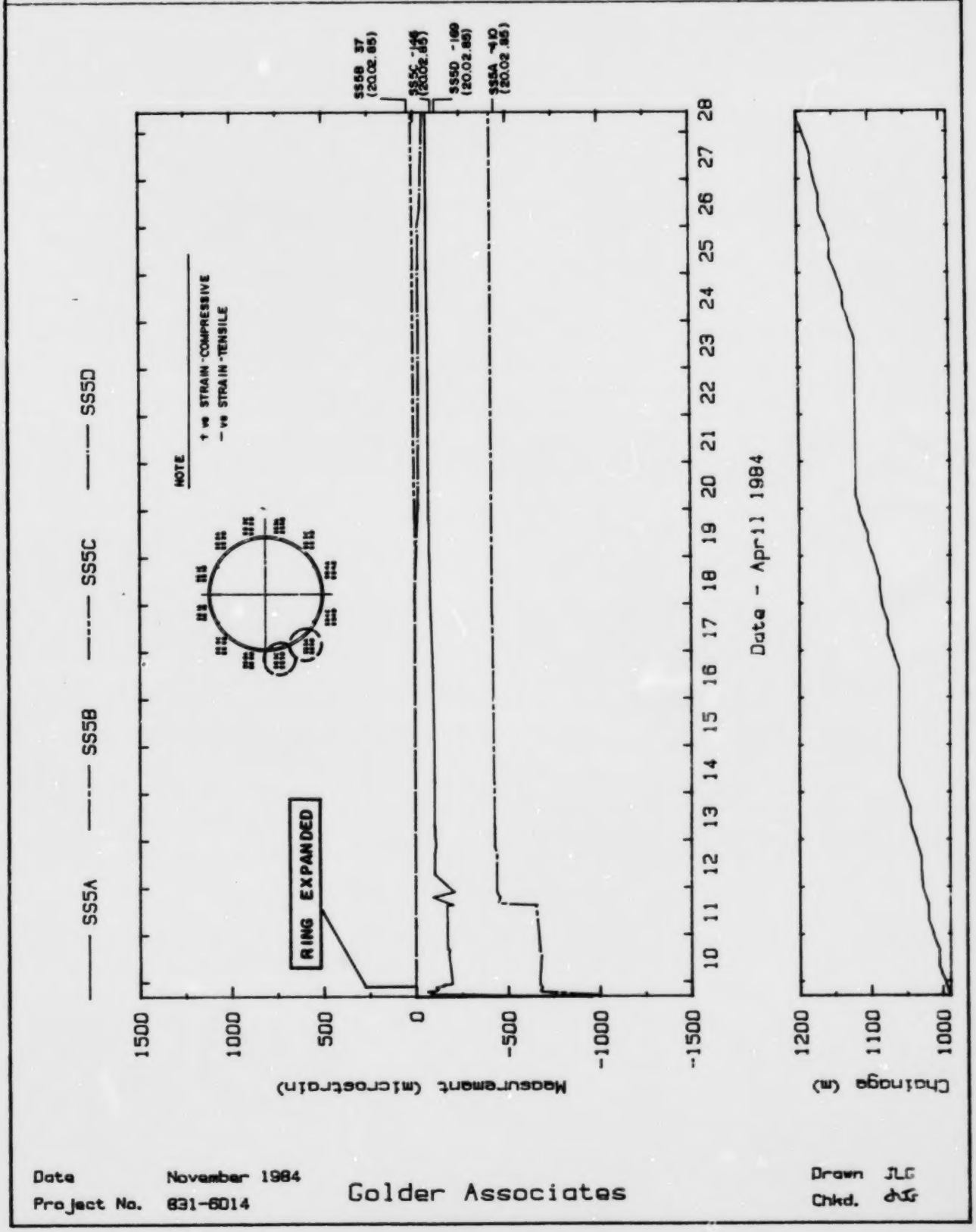
Drawn JLG

Chkd. dhg

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - West lower side - ch. 984m

FIGURE CJ08



Date November 1984

Project No. 831-6014

Golder Associates

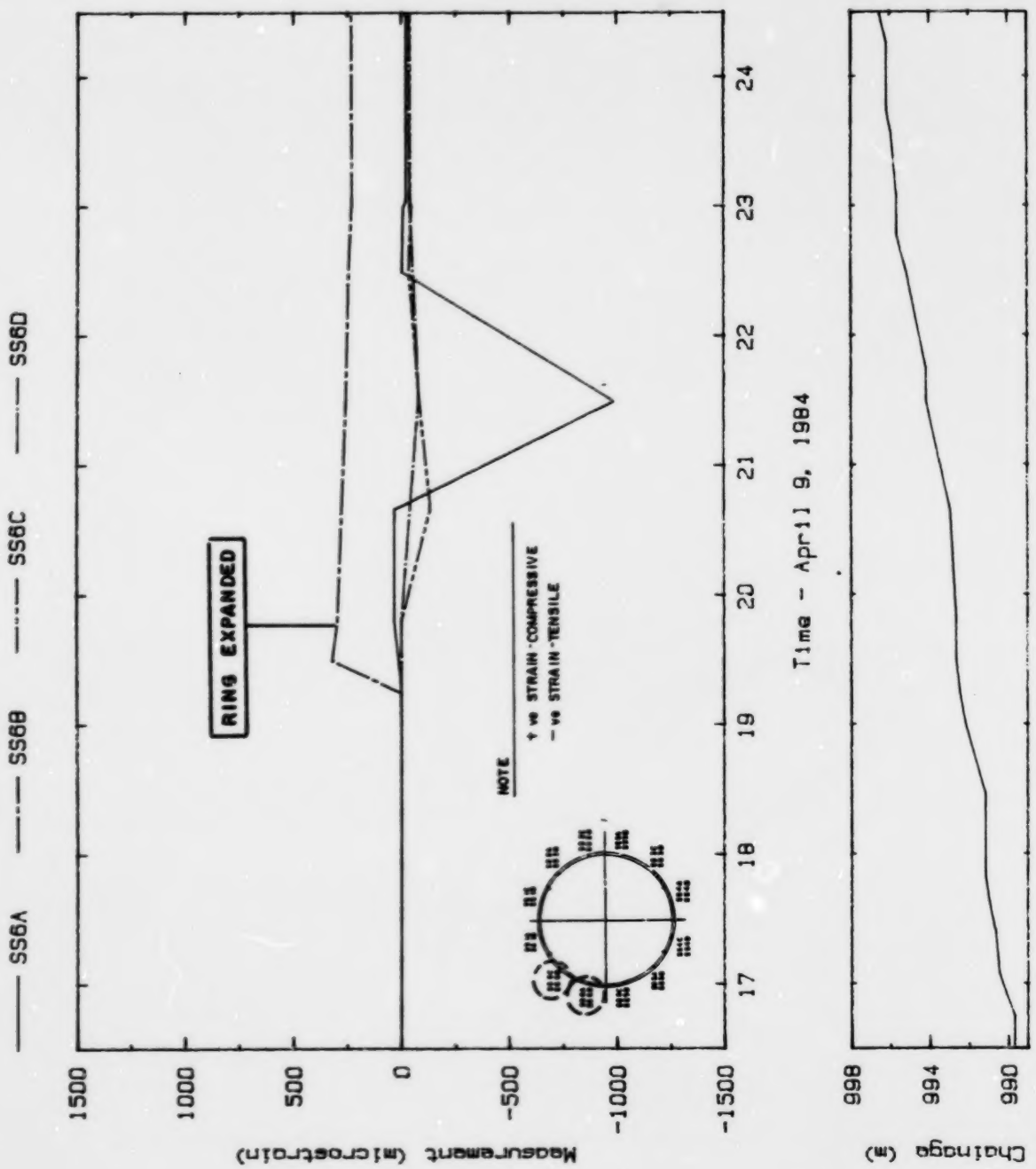
Drawn JLG

Chkd. [illegible]

.STEEL SET STRAIN MEASUREMENTS

Steel Set #6 - West upper side - ch. 984m

FIGURE C.109



Date November 1984

Project No. 831-6014

Golder Associates

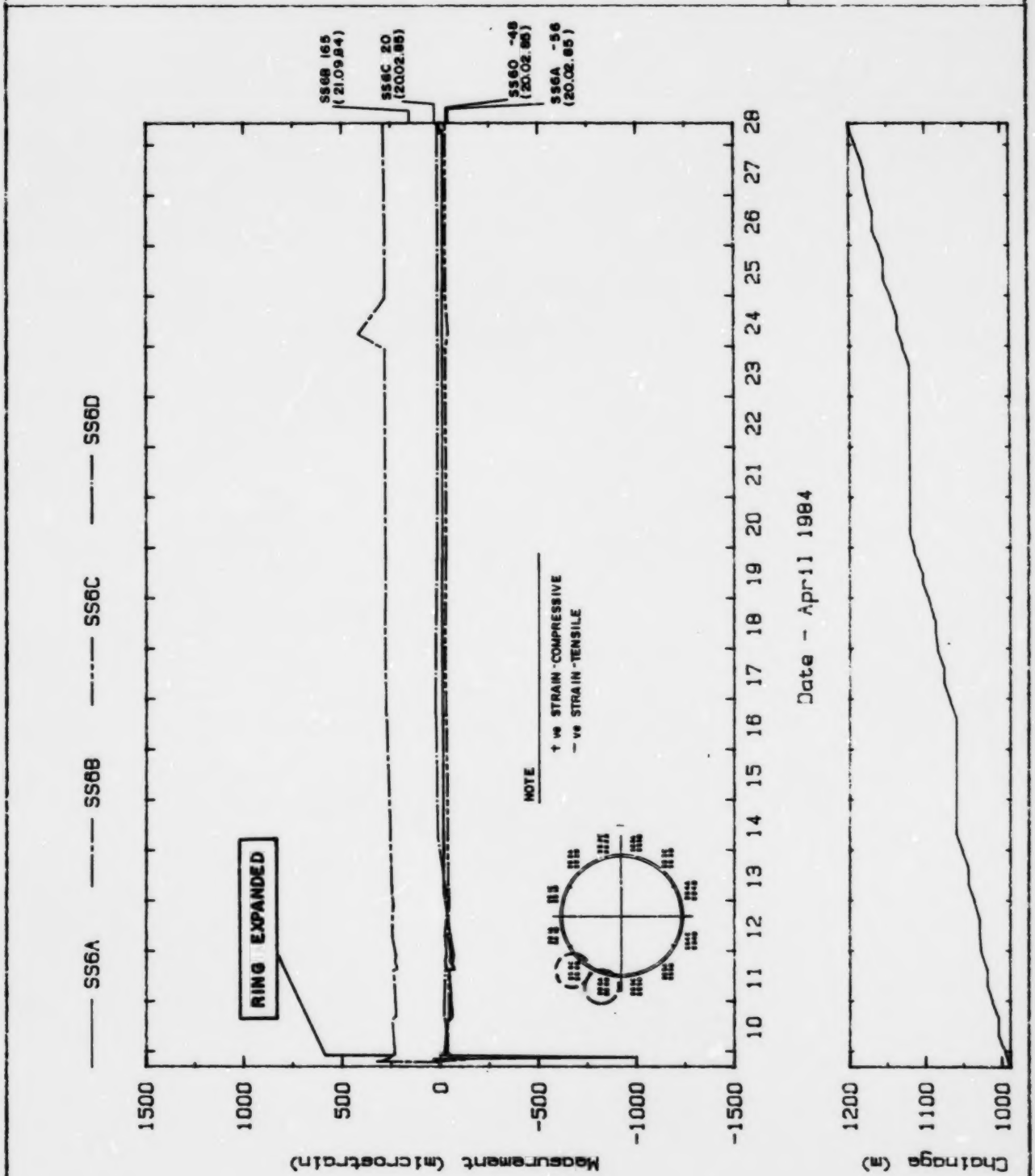
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #6 - West upper side - ch. 984m

FIGURE C.110



Date November 1984

Project No. 831-6014

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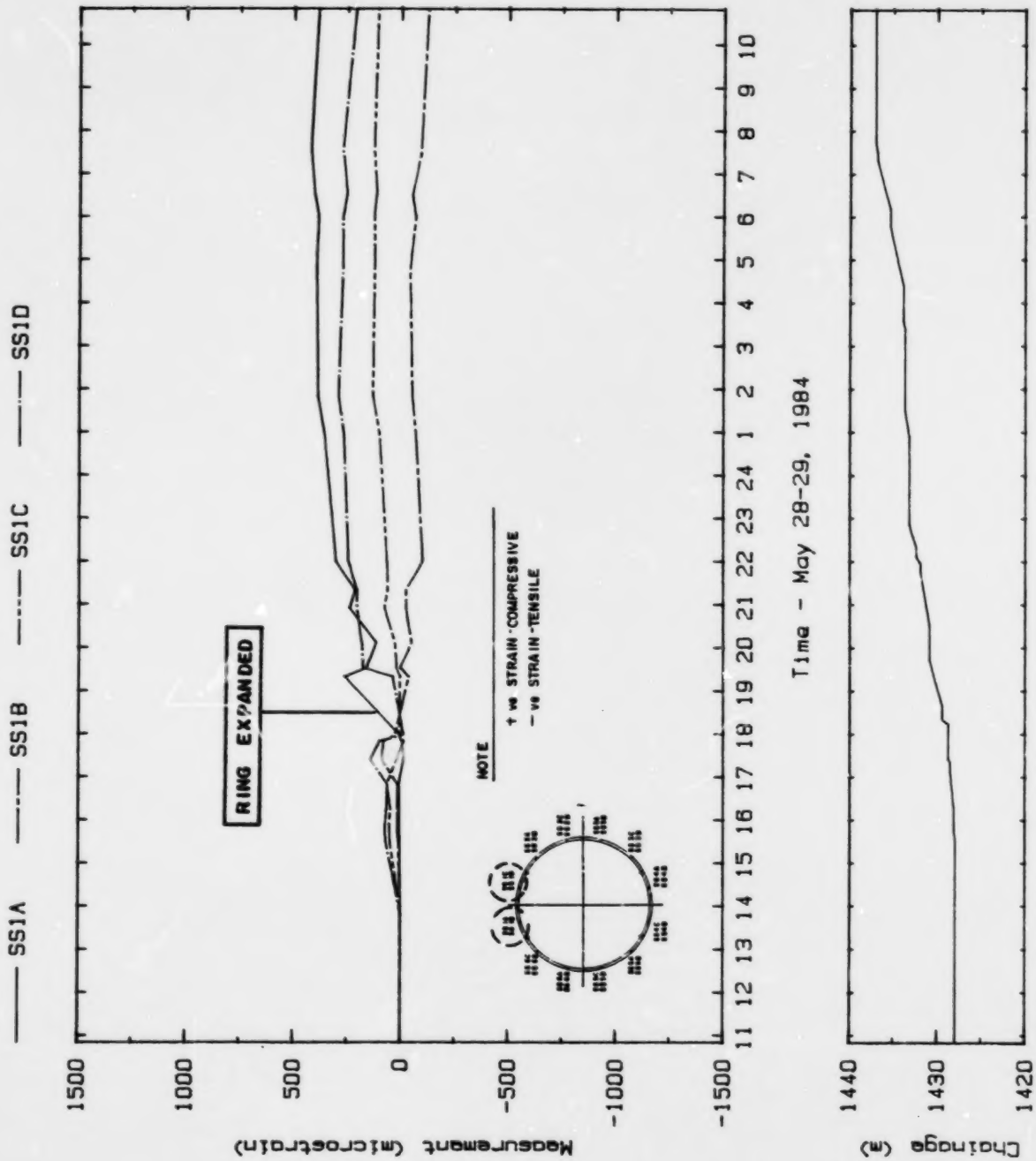
Chkd. dJS

STEEL SET STRAIN MEASUREMENTS

Steel Set #1 - Crown - ch. 1423m

FIGURE C.111



Date November 1984

Project No. 831-6014

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Drawn JLG

Chkd. JJG

STEEL SET STRAIN MEASUREMENTS

Steel Set #1 - Crown - ch. 1423m

FIGURE C.112

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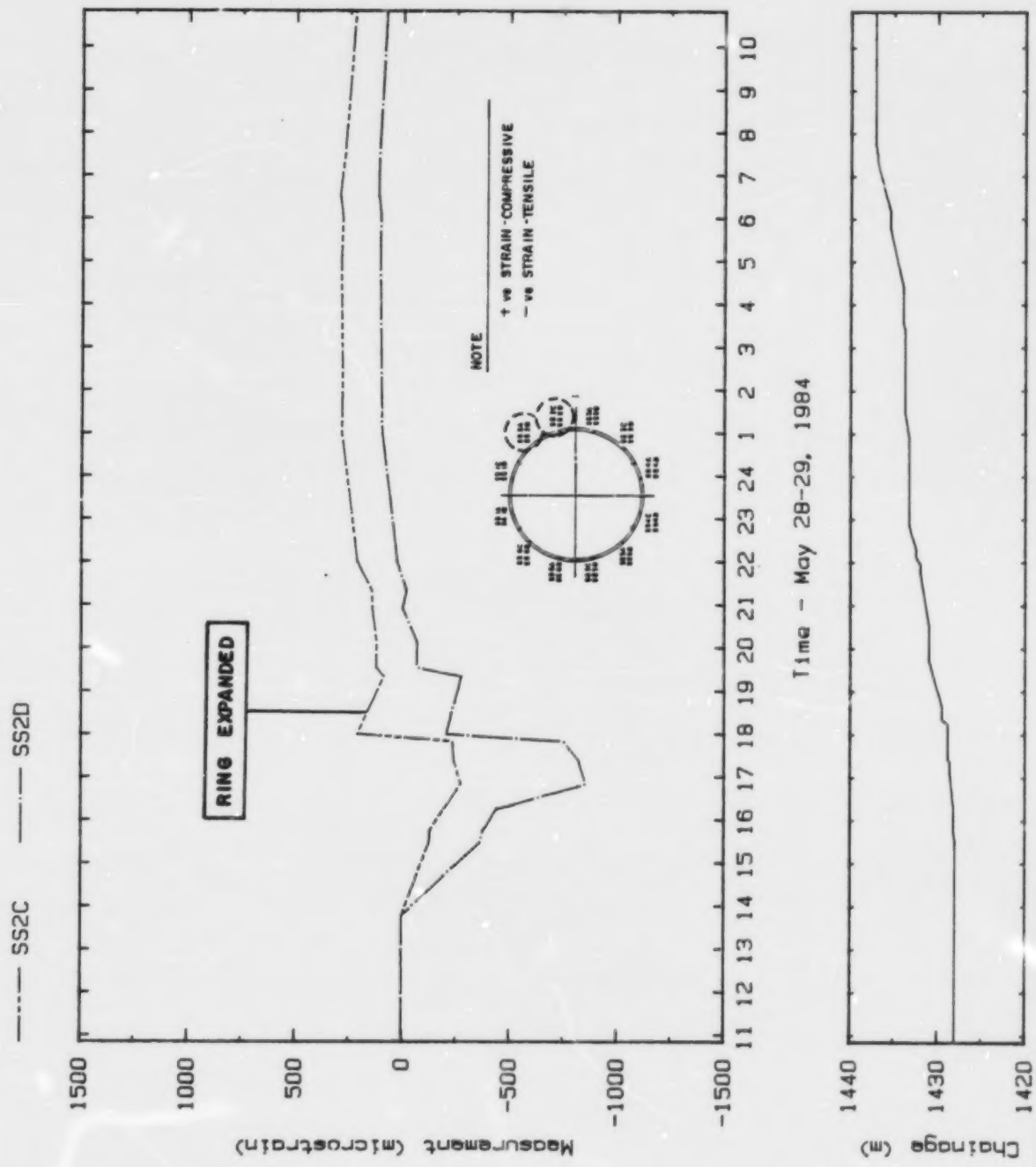
Chkd. dkr

STEEL SET STRAIN MEASUREMENTS
Steel Set #2 - Upper East Side - ch. 1423m

FIGURE C.113



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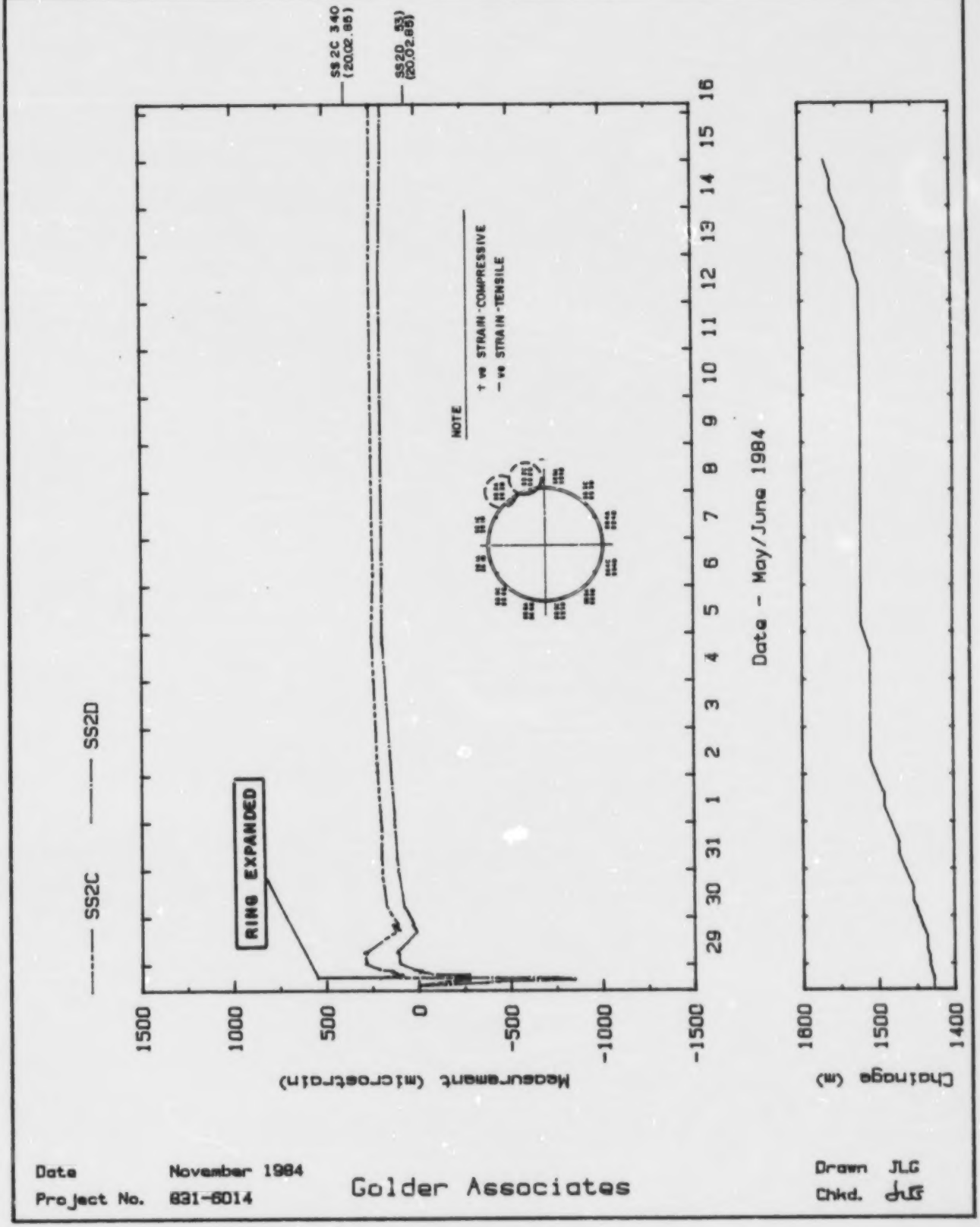
Drawn JLG
Chkd. [illegible]

STEEL SET STRAIN MEASUREMENTS

Steel Set #2 - Upper East Side - ch. 1423m

FIGURE C.114



Date November 1984

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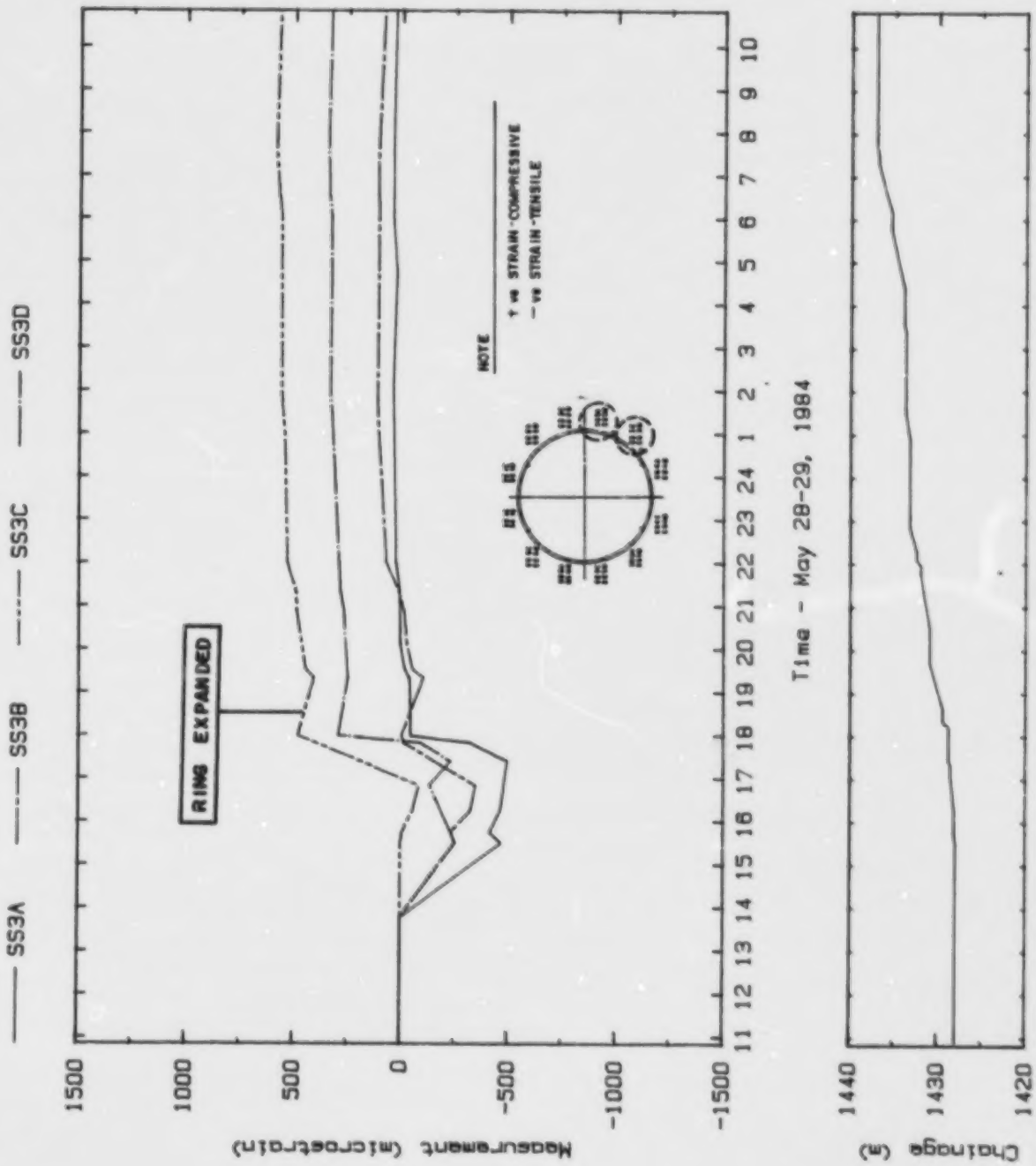
Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #3 - Lower East Side - ch. 1423m

FIGURE C.115



Date November 1984

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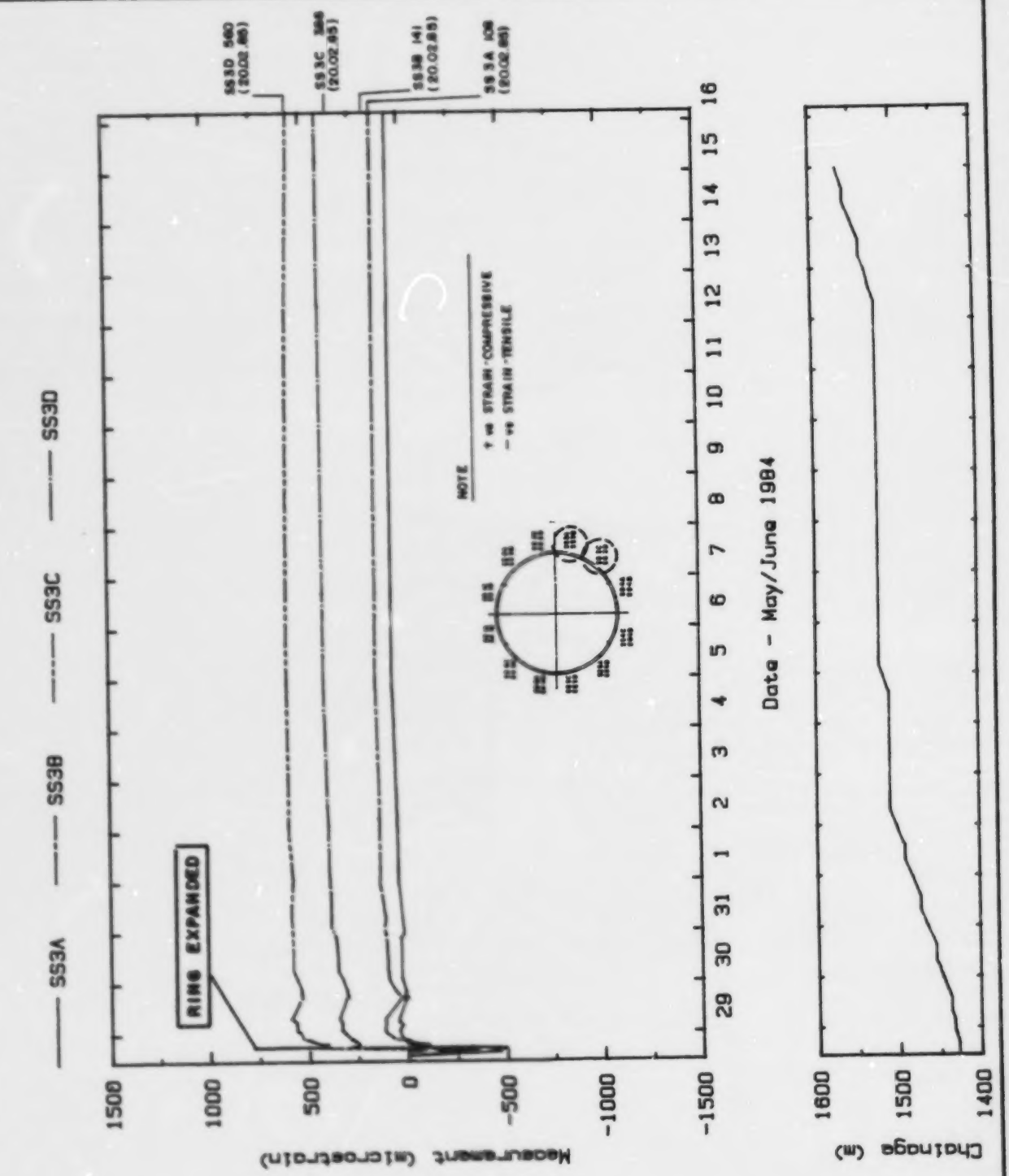
Chkd. dlg

STEEL SET STRAIN MEASUREMENTS

Steel Set #3 - Lower East Side - ch. 1423m

FIGURE C.116



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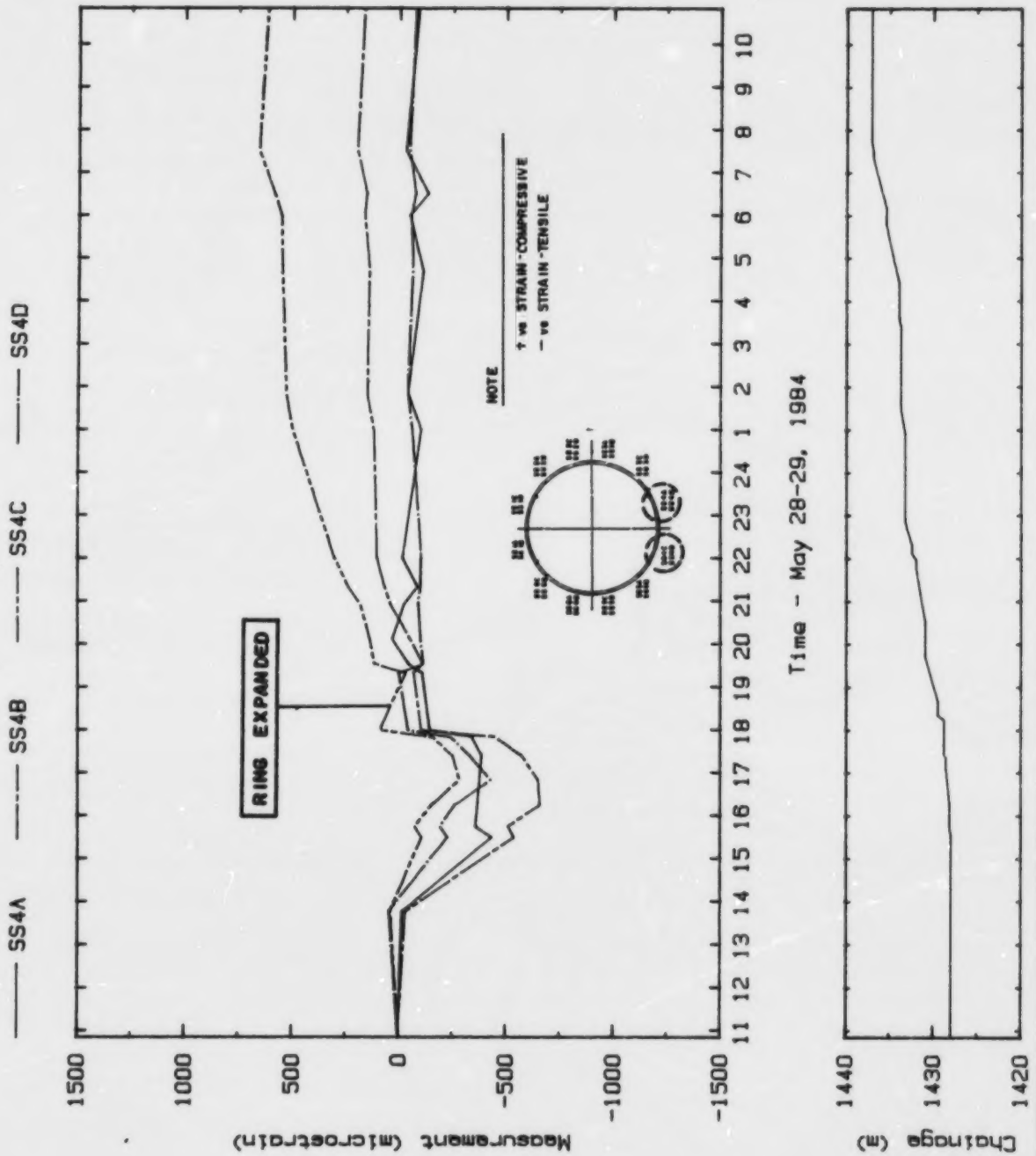
Chkd.

STEEL SET STRAIN MEASUREMENTS

Steel Set #4 - Invert - ch. 1423m

FIGURE C.117



Date November 1984

Project No. 831-6014

Golder Associates

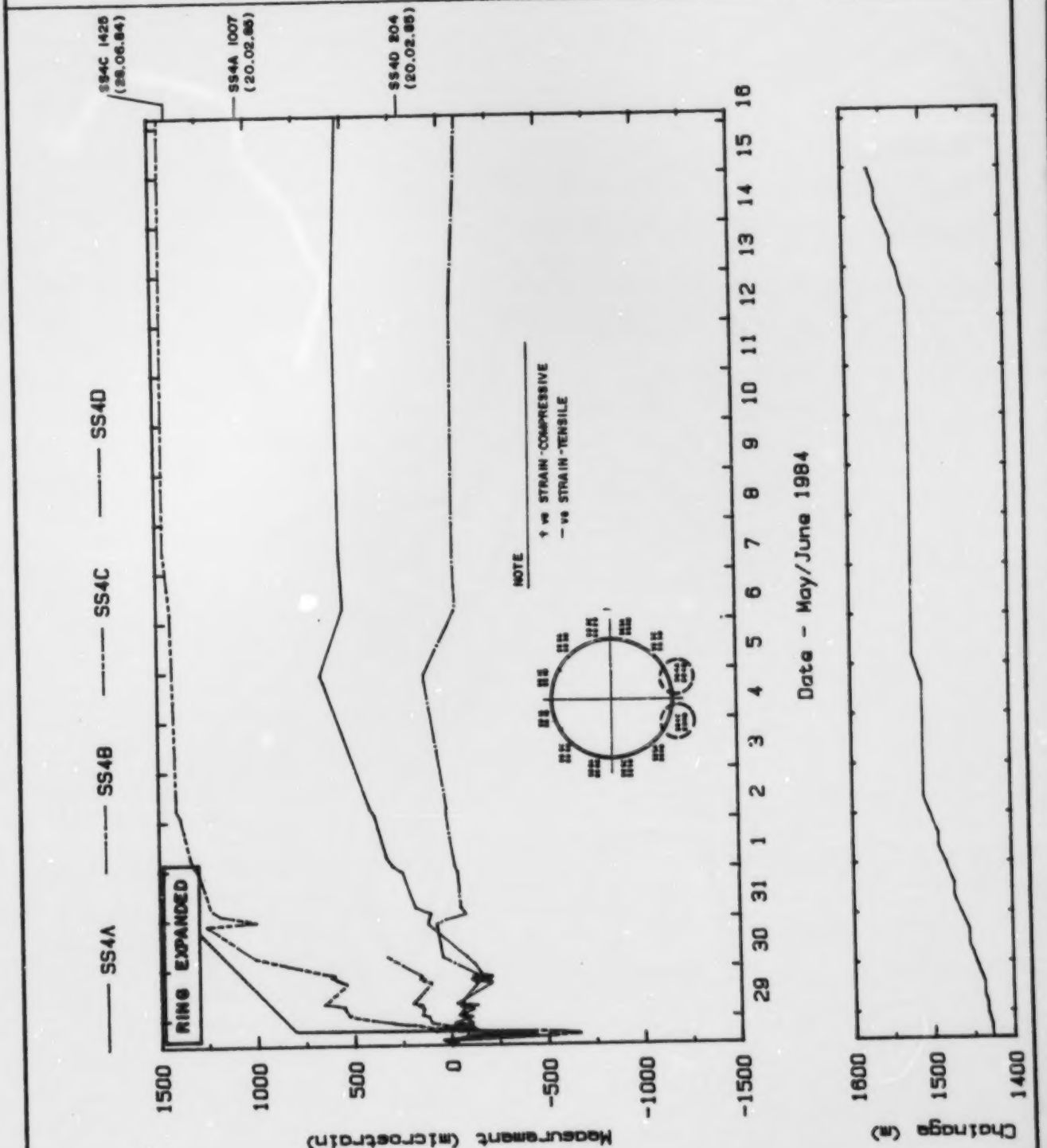
Drawn JLG

Chkd. JJR

STEEL SET STRAIN MEASUREMENTS

Steel Set #4 - Invart - ch. 1423m

FIGURE C.118



Date November 1984

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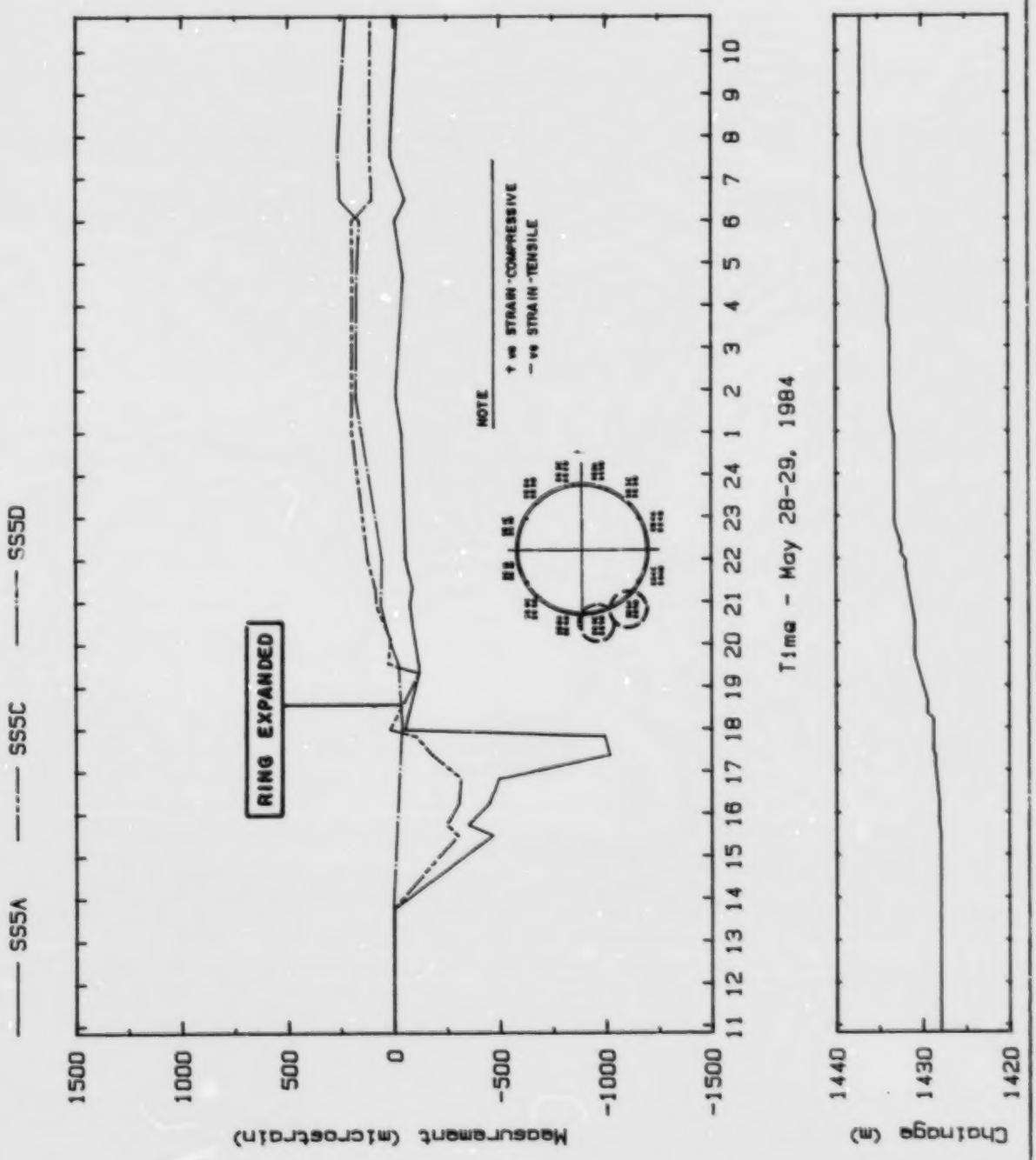
Chkd. dJG

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - Lower West Side - ch. 1423m

FIGURE C.119



Date November 1984

Project No. 831-8014

Golder Associates

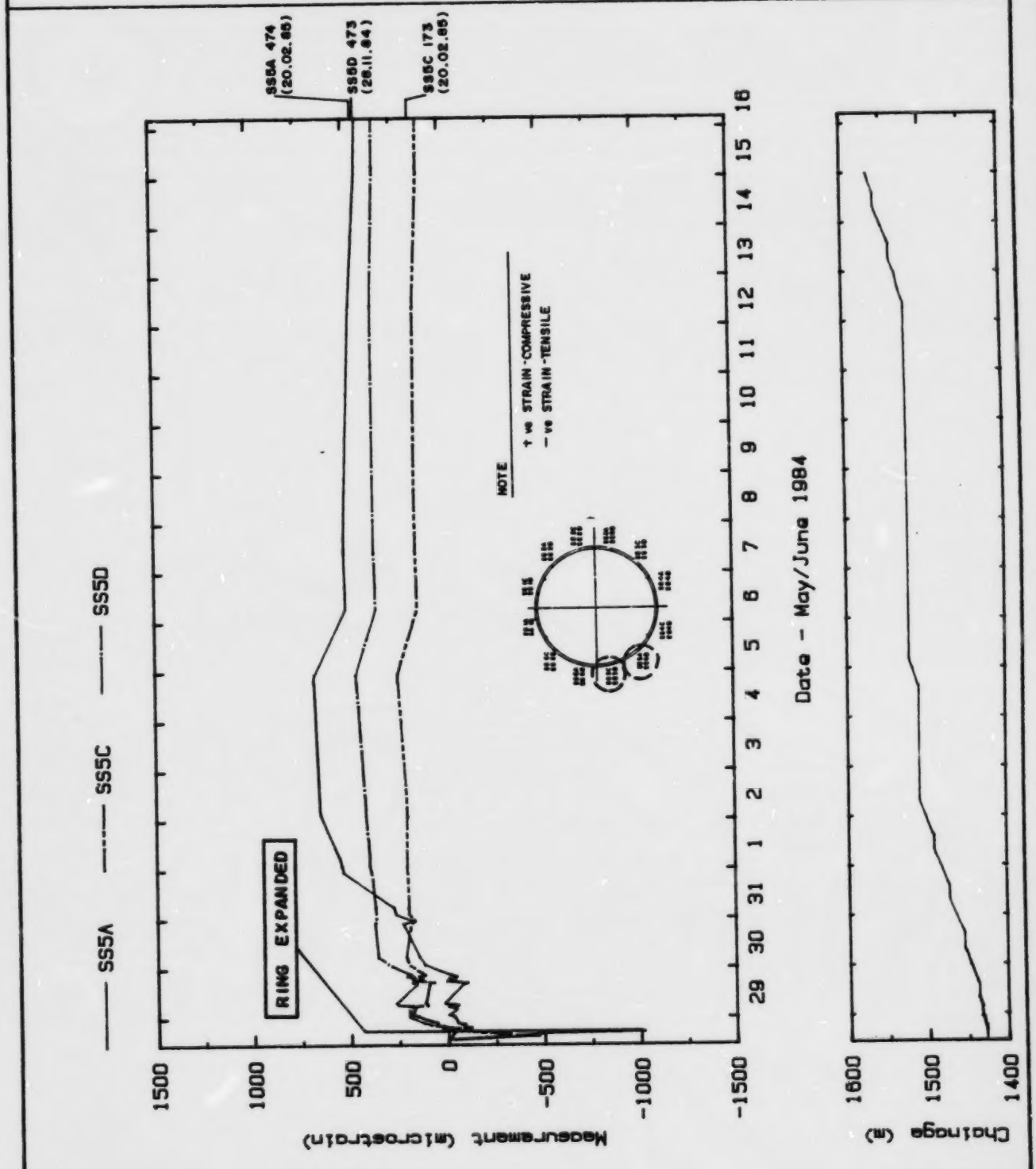
Drawn JLG

Chkd.

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - Lower West Side - ch. 1423m

FIGURE C.120



Date November 1984

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Golder Associates

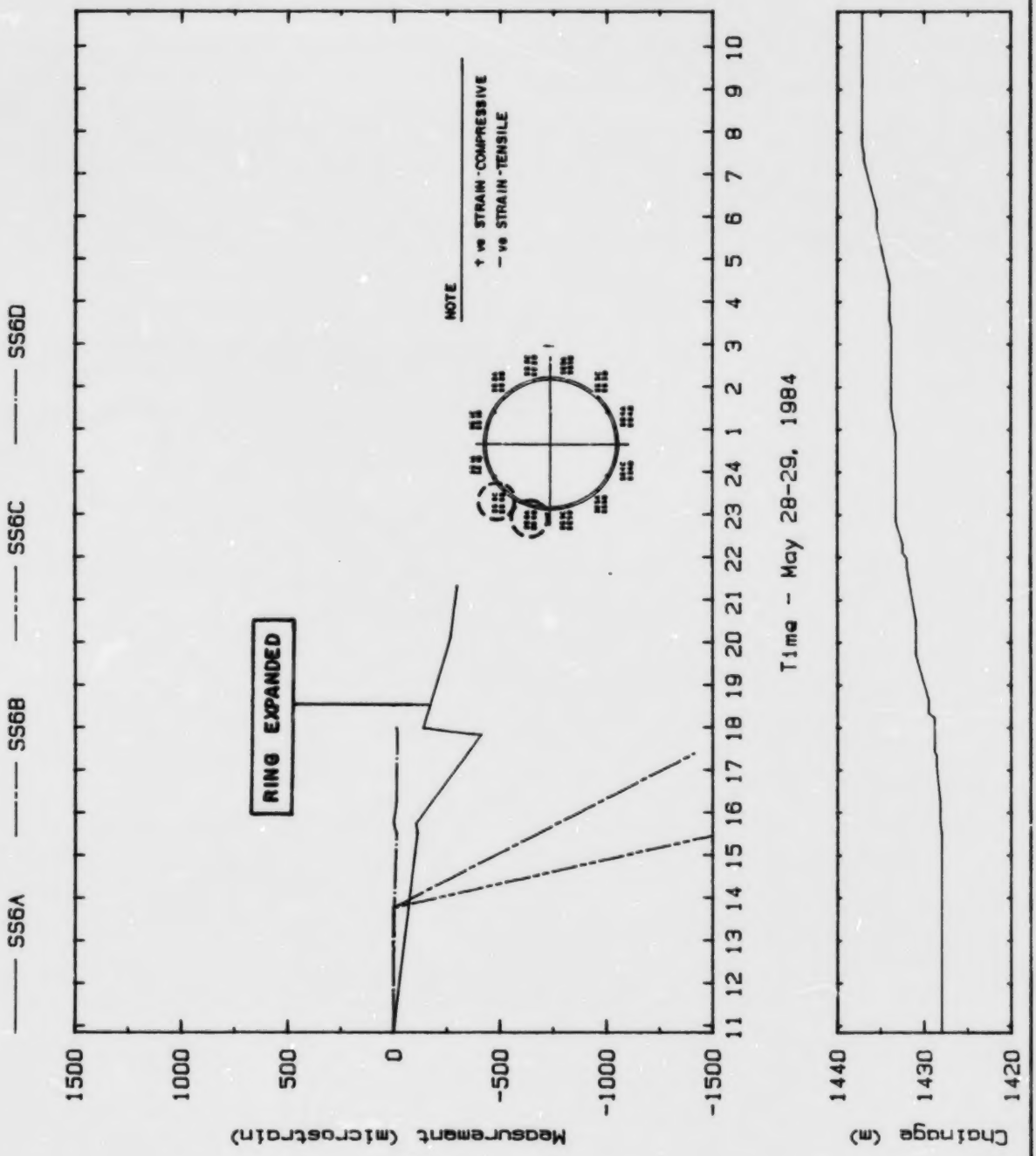
Drawn JLG

Chkd. dvG

STEEL SET STRAIN MEASUREMENTS

Steel Set #6 - Upper West Side - ch. 1423m

FIGURE C.121



Date November 1984

Project No. 831-6014

Golder Associates

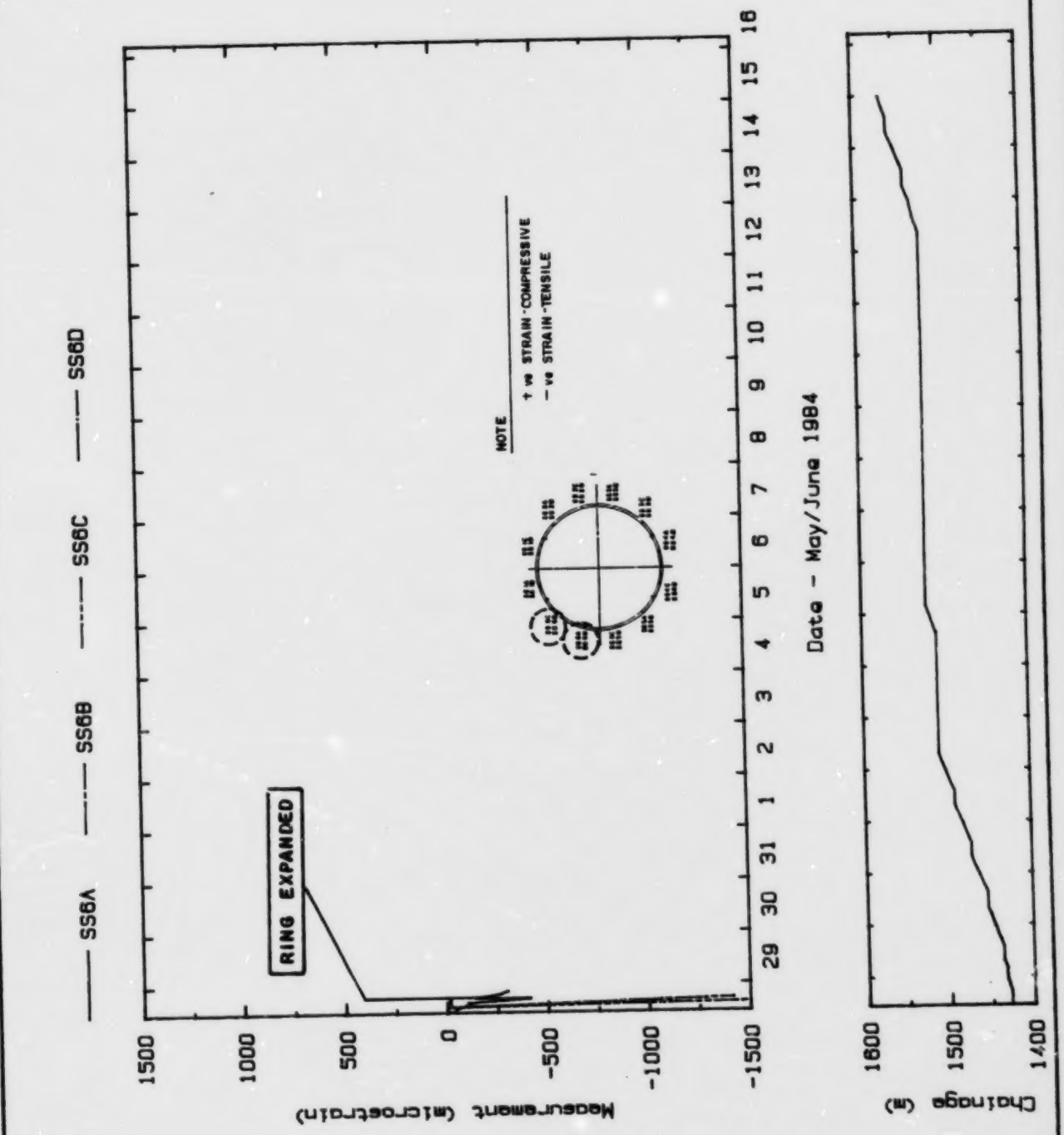
Drawn JLG

Chkd. DHG

STEEL SET STRAIN MEASUREMENTS

Steel Set #6 - Upper West Side - ch. 1423m

FIGURE C.122



Date November 1984

Project No. 831-6014

Golder Associates

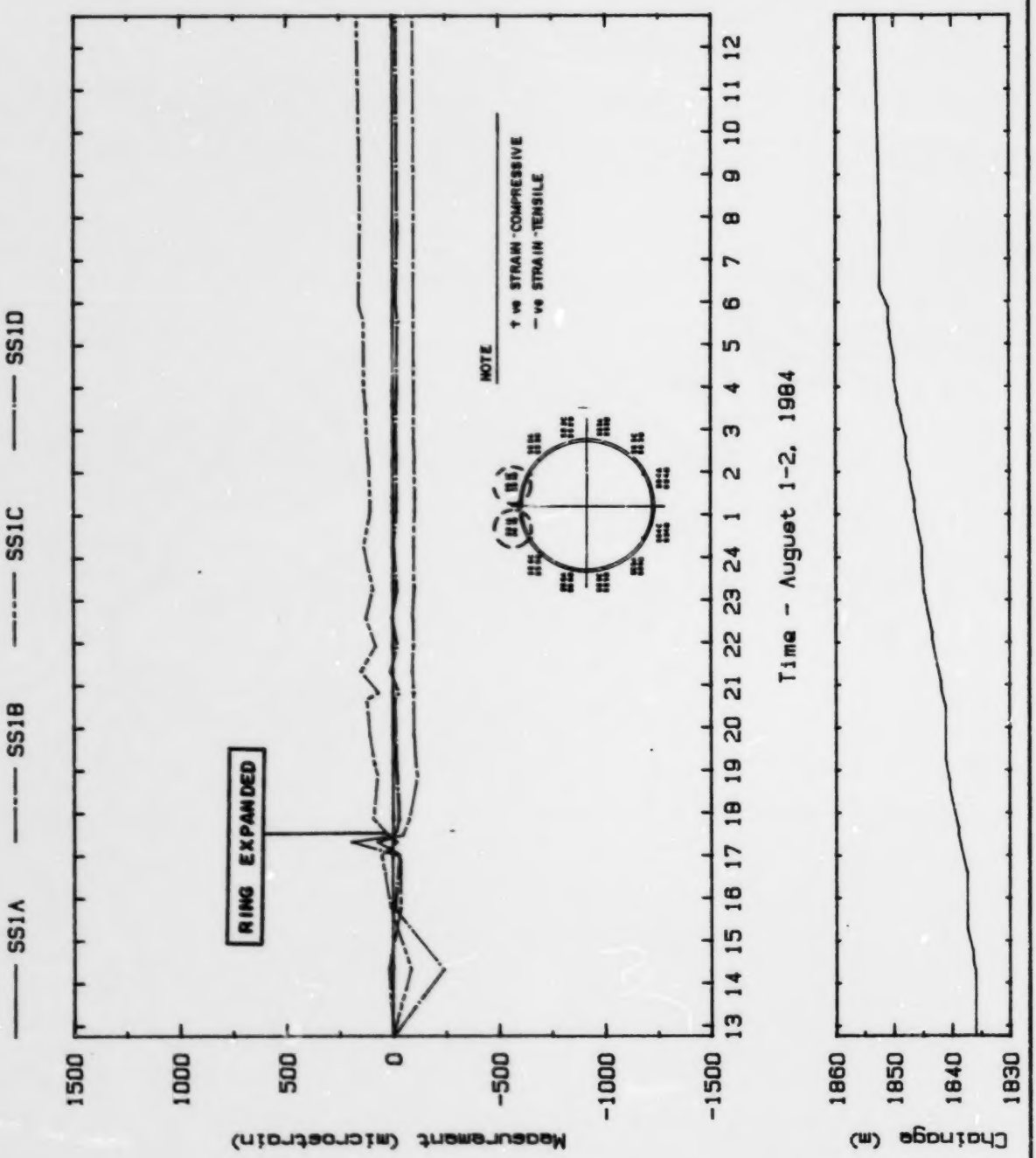
Drawn JLG

Chkd. JSC

STEEL SET STRAIN MEASUREMENTS

Steel Set #1 - Crown - ch. 1831m

FIGURE C.123



Date November 1984

Project No. 831-6014

Golder Associates

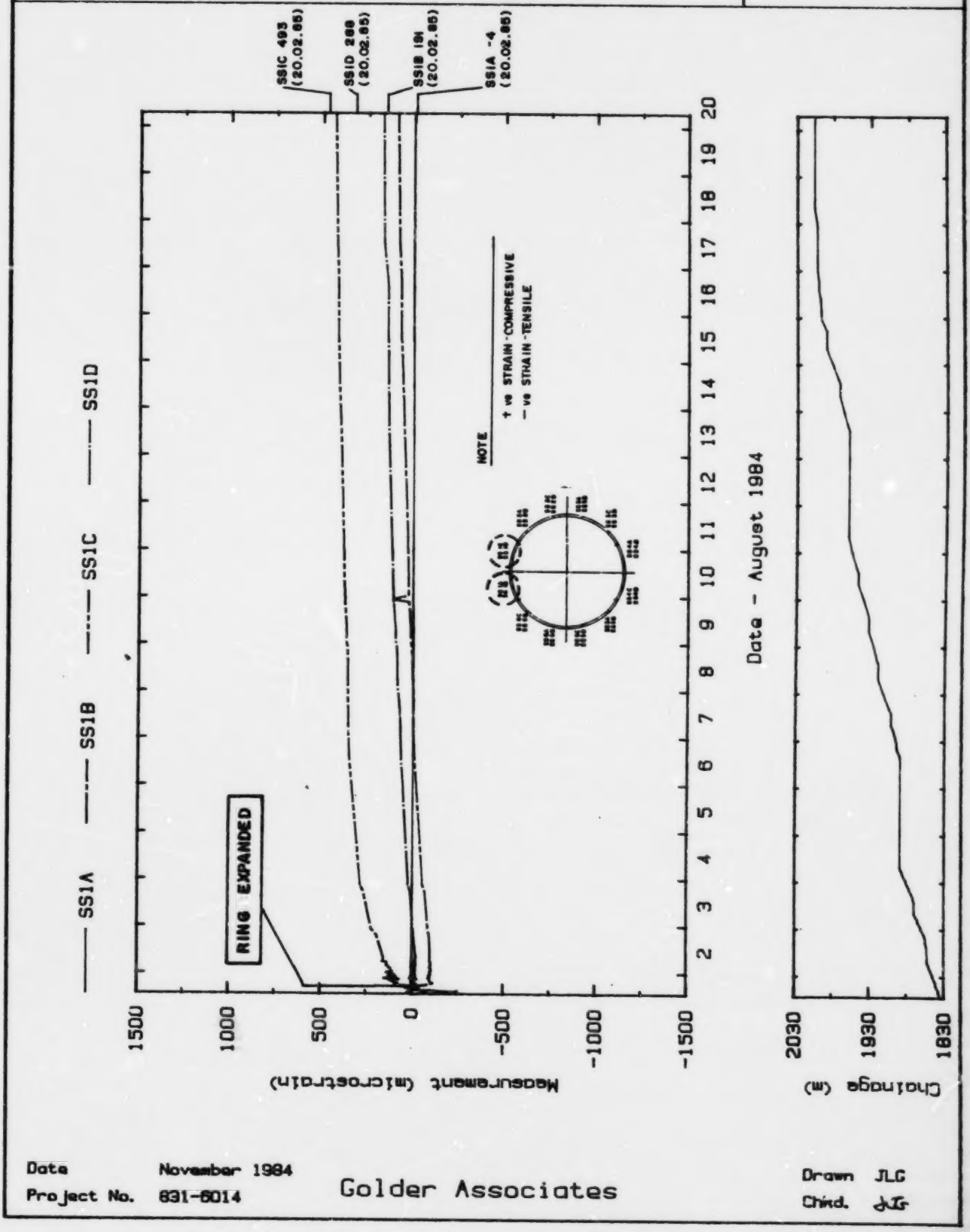
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #1 - Crown - ch. 1831m

FIGURE C.124



Date November 1984

Project No. 831-6014

Golder Associates

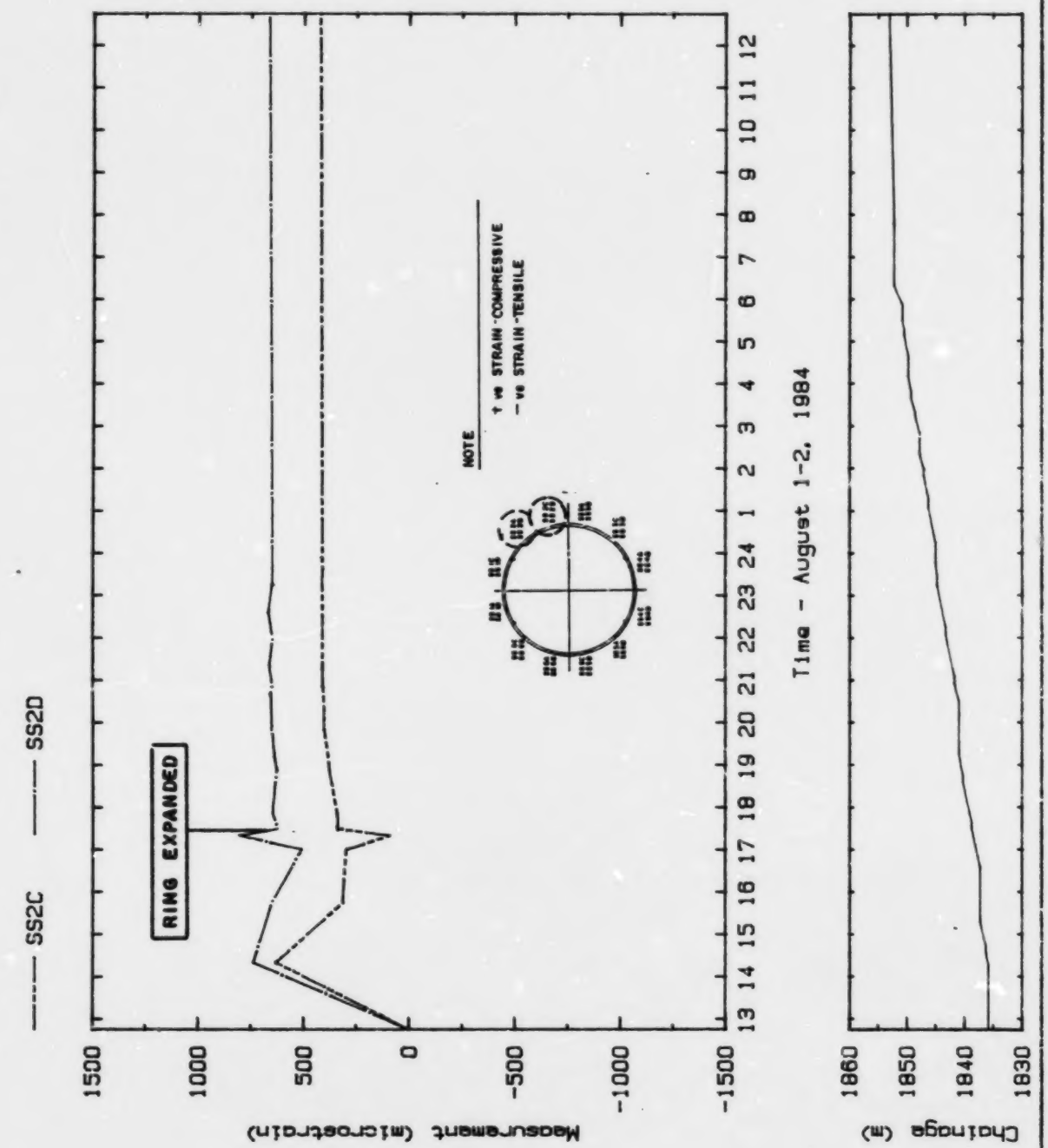
Drawn JLC

Chkd. JG

STEEL SET STRAIN MEASUREMENTS

Steel Set #2 - Upper East Side - ch. 1831m

FIGURE C.125



Date November 1984

Project No. 831-6014

Golder Associates

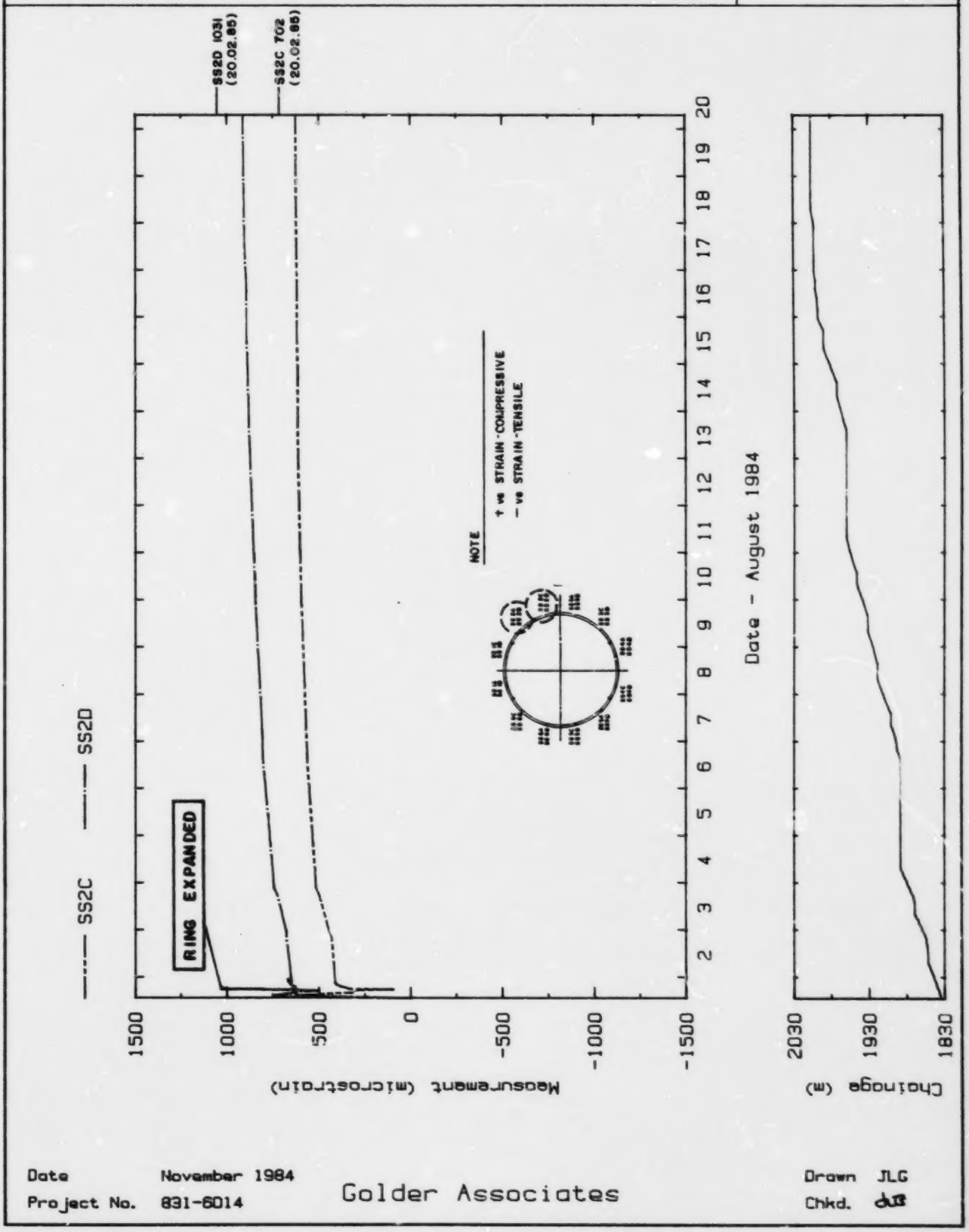
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #2 - East upper side - ch. 1831m

FIGURE C.126



Date November 1984

Project No. 831-6014

Golder Associates

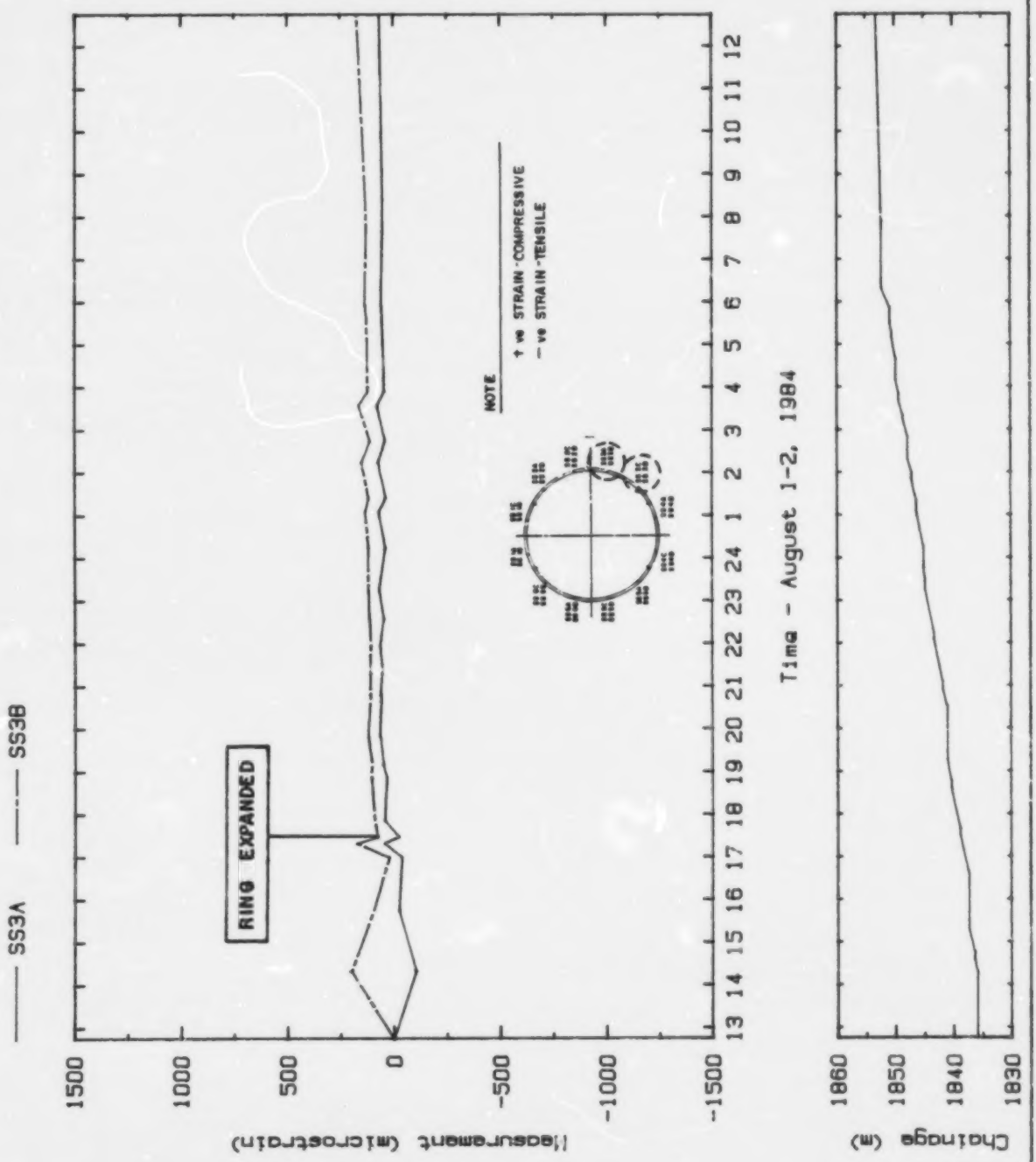
Drawn JLG

Chkd. dlf

STEEL SET STRAIN MEASUREMENTS

Steel Set #3 - Lower East Side - ch. 1831m

FIGURE C.127



Date November 1984

Project No. 831-6014

Golder Associates

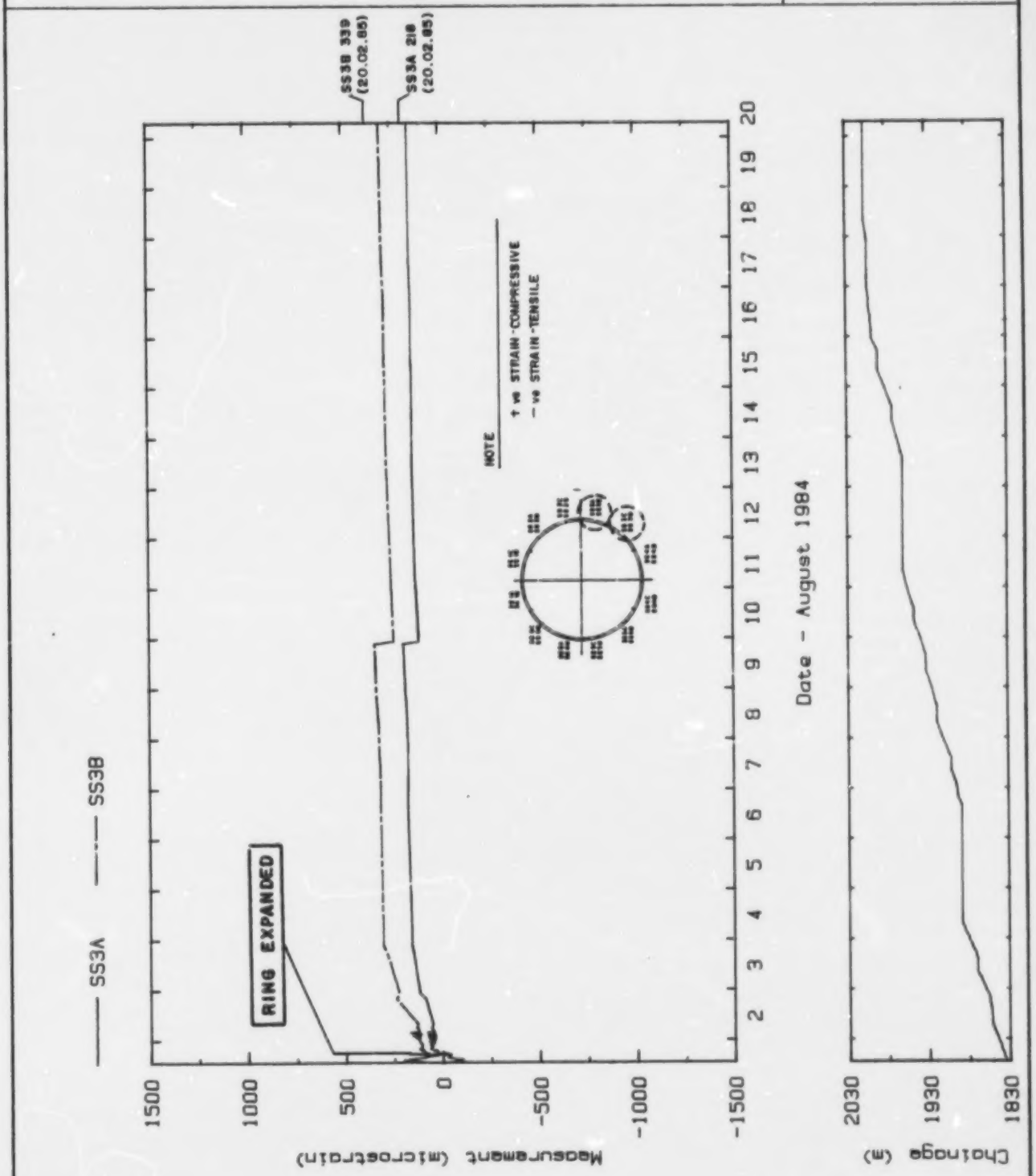
Drawn JLG

Chkd. dcr

STEEL SET STRAIN MEASUREMENTS

Steel Set #3 - East lower side - ch. 1831m

FIGURE C.128



Date November 1984

Project No. 831-6014

Golder Associates

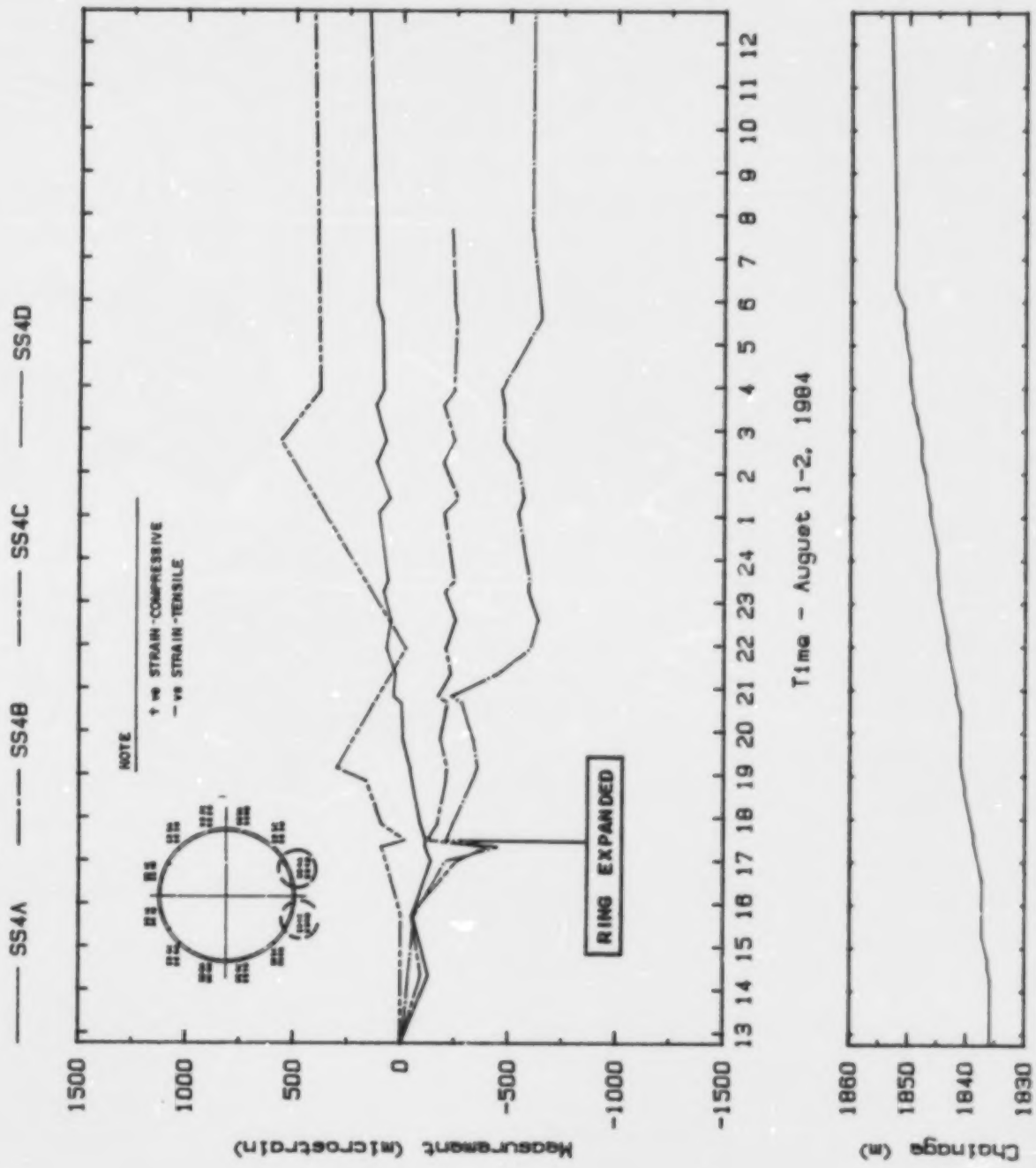
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #4 - Invert - ch. 1831m

FIGURE C.129



Date November 1984

Project No. 831-6014

Golder Associates

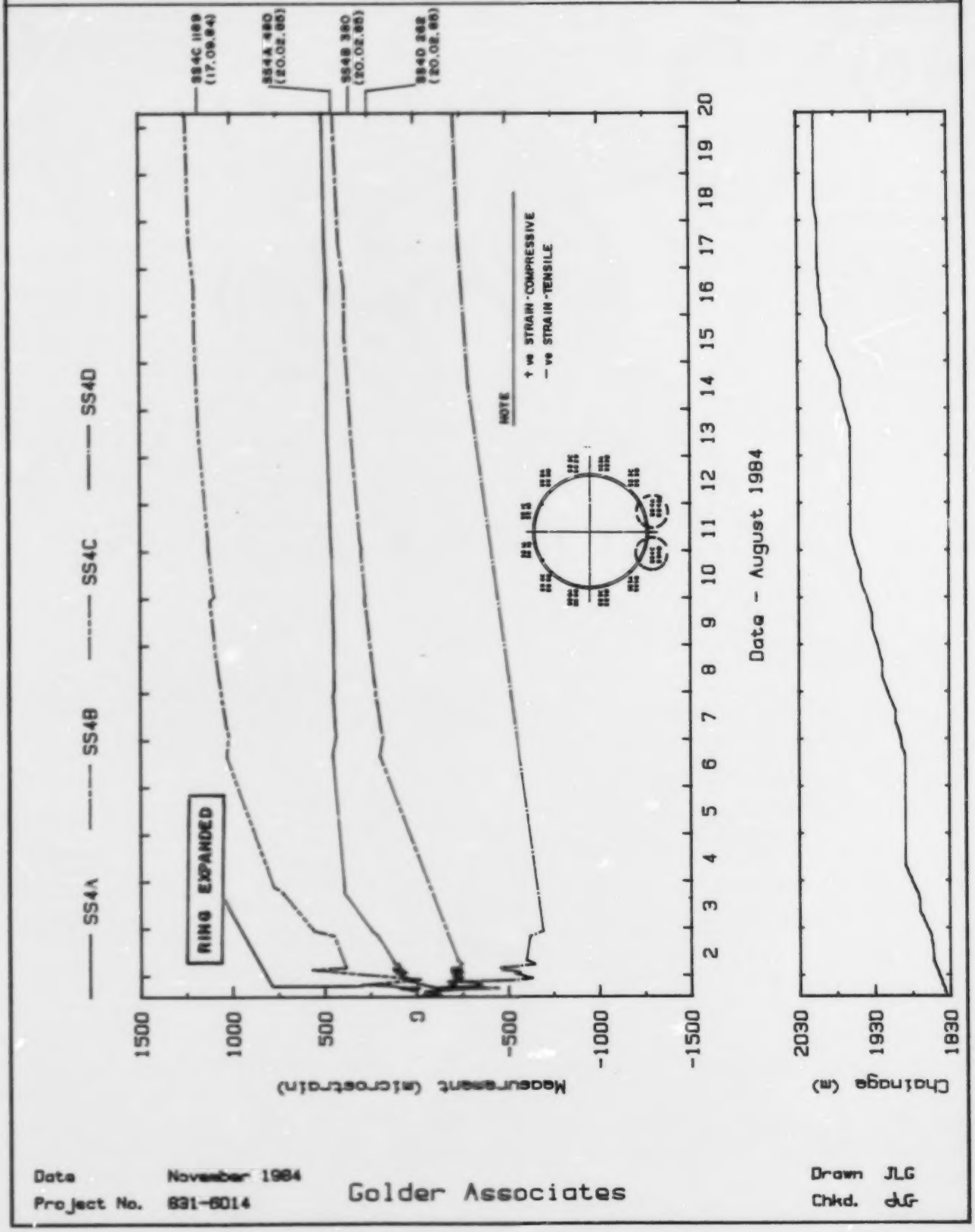
Drawn JLG

Chkd. JF

STEEL SET STRAIN MEASUREMENTS

Steel Set #4 - Invert - ch. 1831m

FIGURE C.130



Date November 1984

Project No. 831-6014

Golder Associates

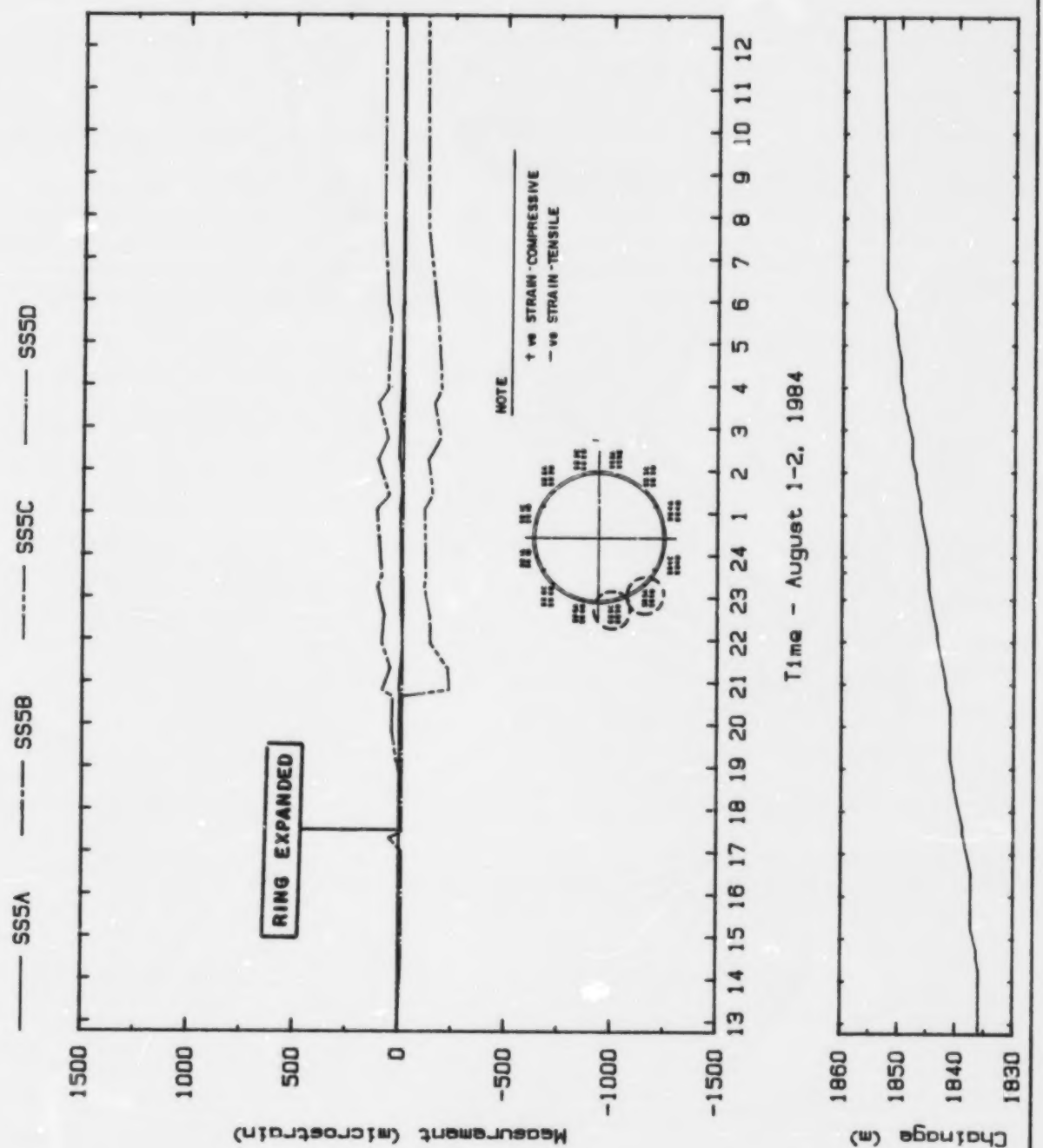
Drawn JLG

Chkd. dJG

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - Lower west side - ch. 1831m

FIGURE C.131



Date November 1984

Project No. 831-6014

Golder Associates

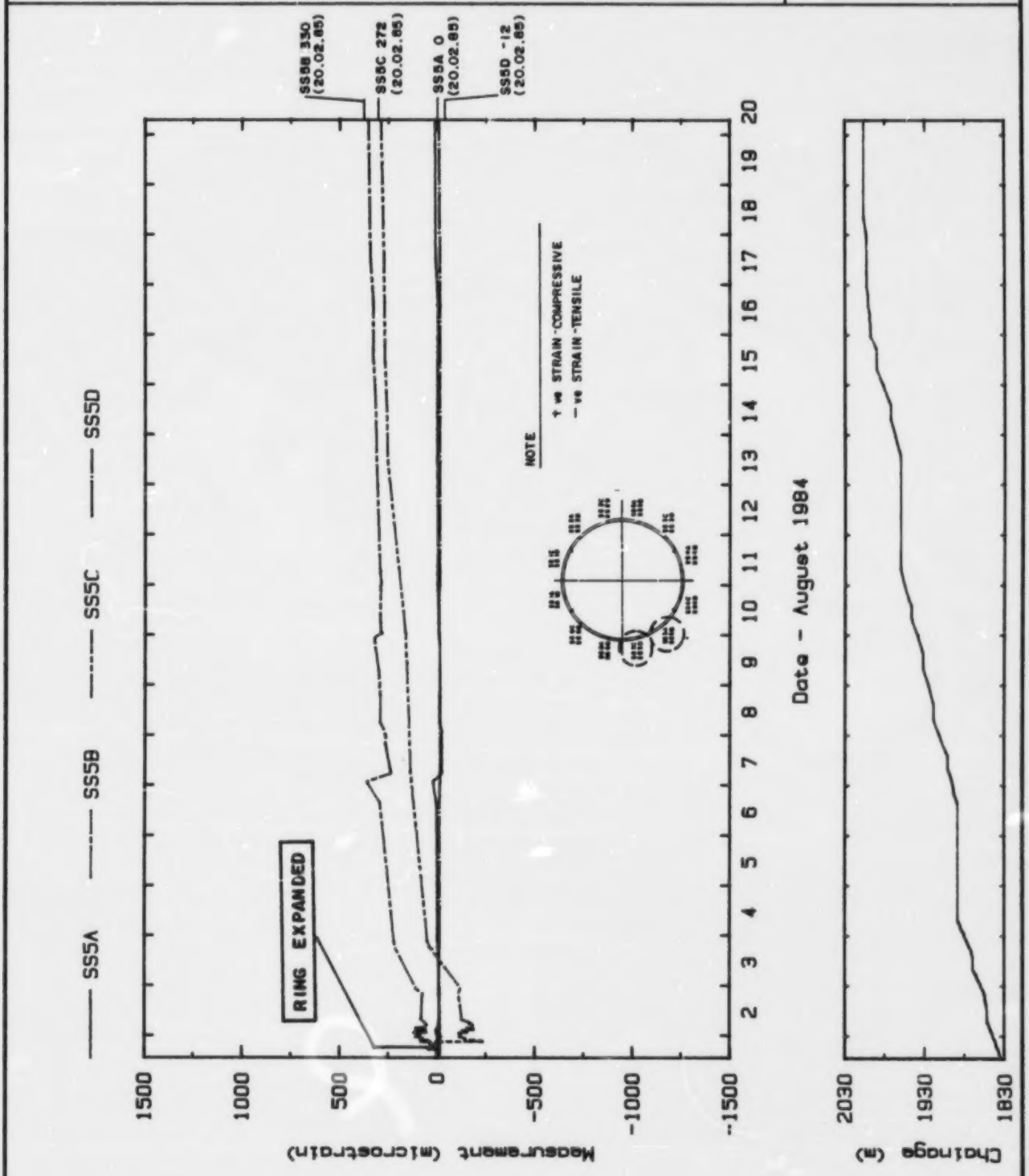
Drawn JLG

Chkd. JG

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - West lower side - ch. 1831m

FIGURE C.132



Date November 1984

Project No. 831-6014

Golder Associates

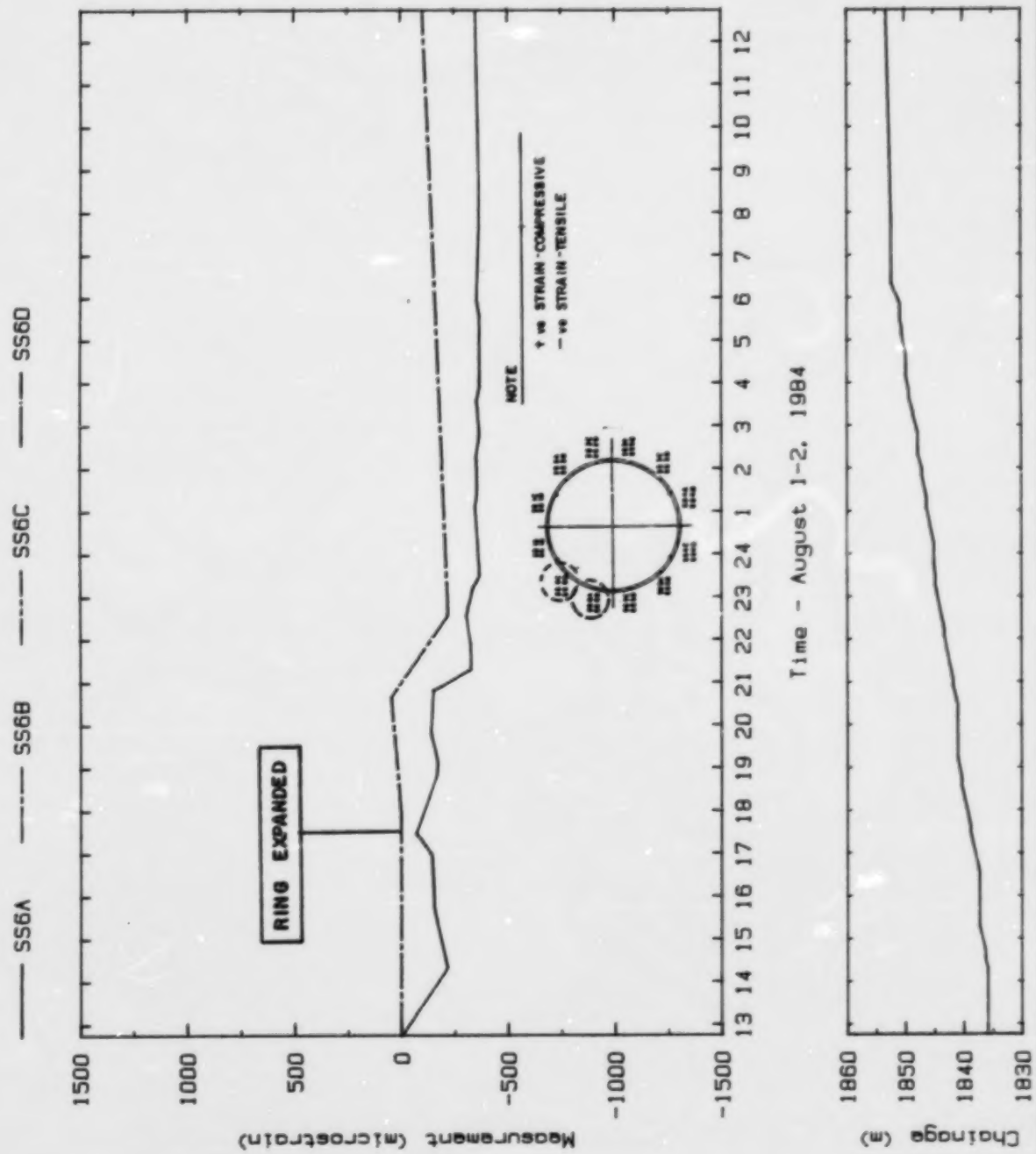
Drawn JLC

Chkd. dvF

STEEL SET STRAIN MEASUREMENTS

Steel Set #6 - Upper west side - ch. 1831m

FIGURE **C.133**



Date November 1984

Project No. 831-6014

Golder Associates

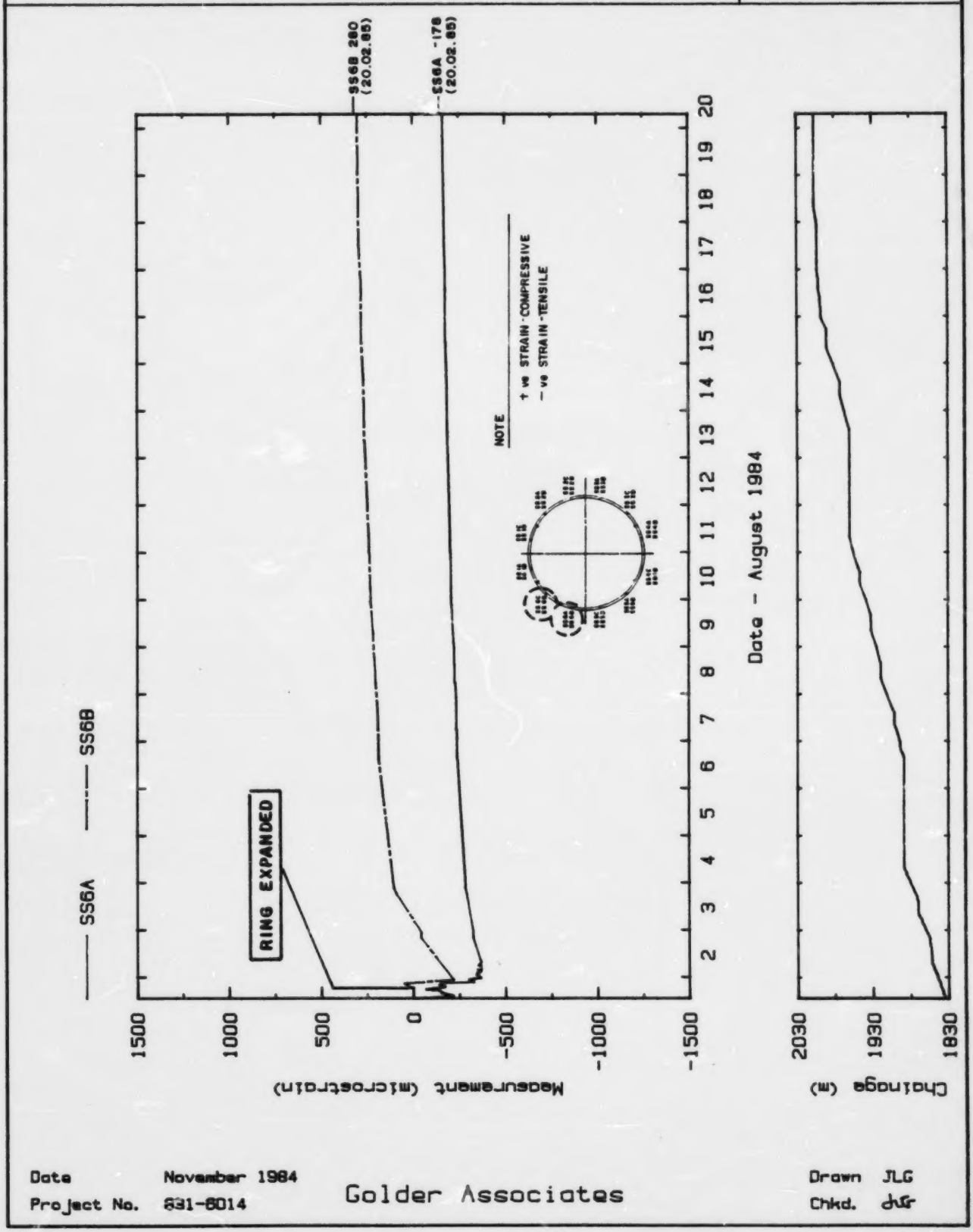
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS.

Steel Set #6 - West upper side - ch. 1831m

FIGURE C.134



Date November 1984

Project No. 831-6014

Golder Associates

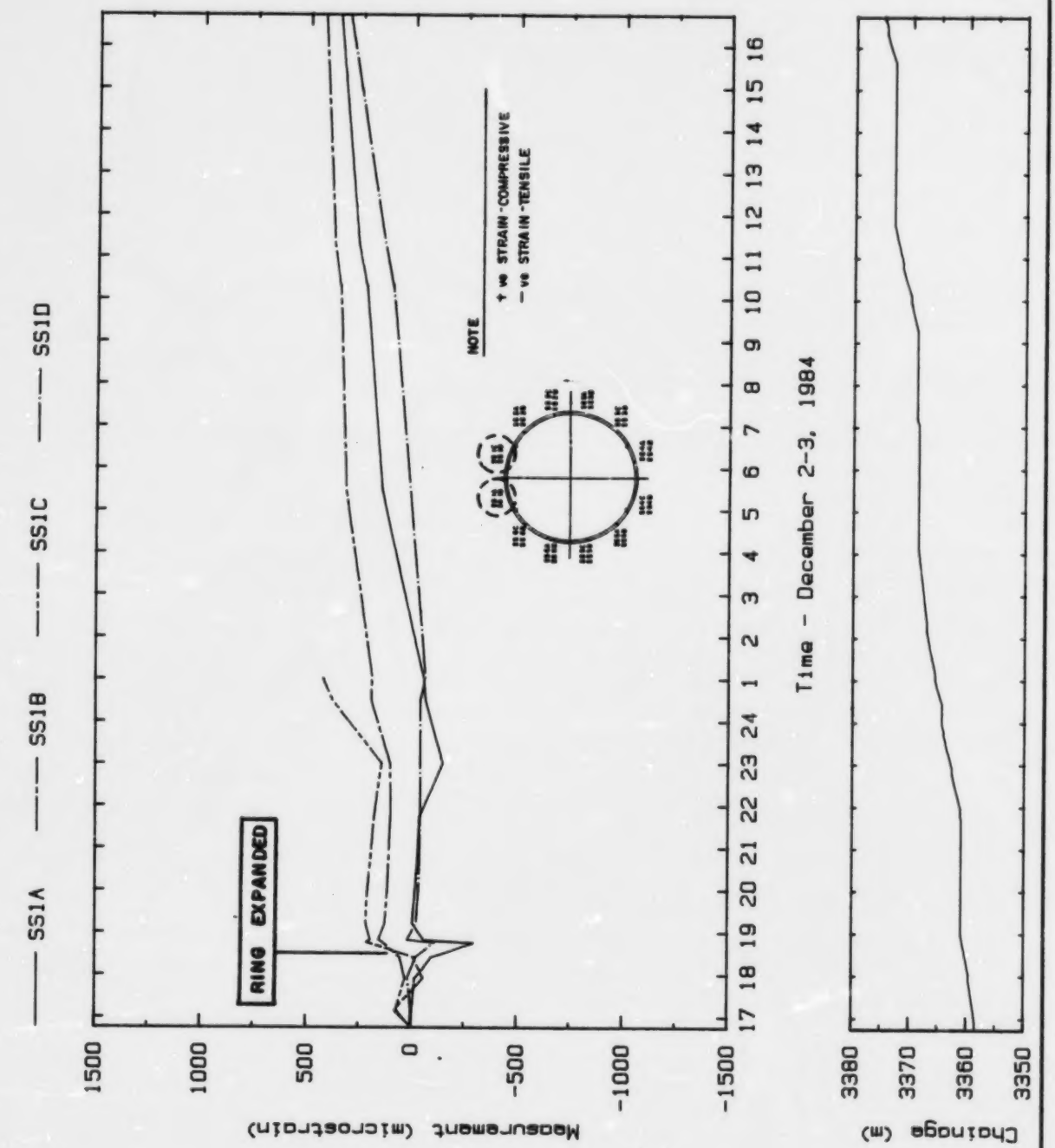
Drawn JLG

Chkd. dsf

STEEL SET STRAIN MEASUREMENTS

Steel Set #1 - Crown - ch. 3353m

FIGURE C.135



Date April 1985

Project No. 831-6014

Golder Associates

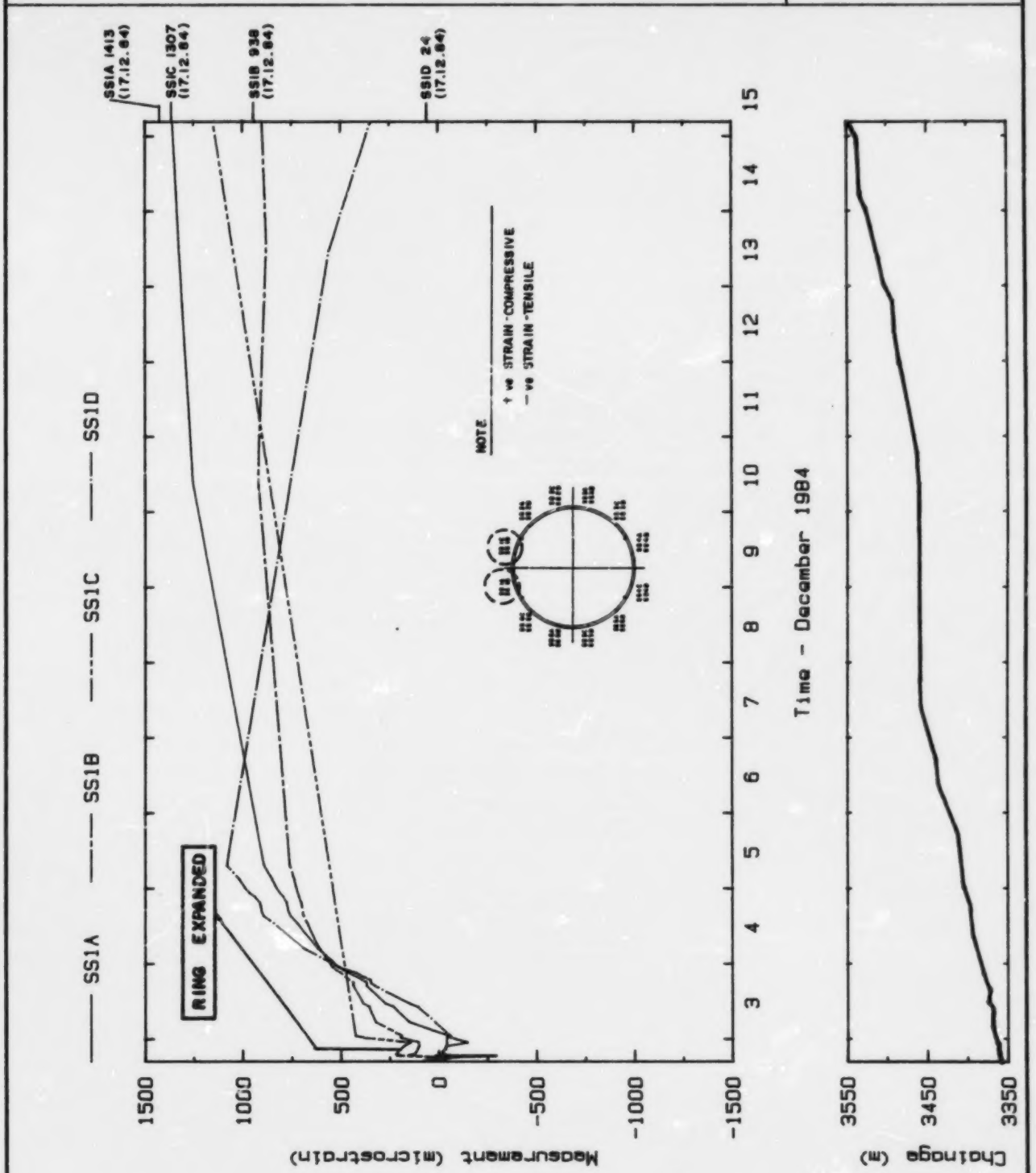
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #1 - Crown - ch. 3353m

FIGURE C.136



Date April 1985

Project No. 831-6014

Golder Associates

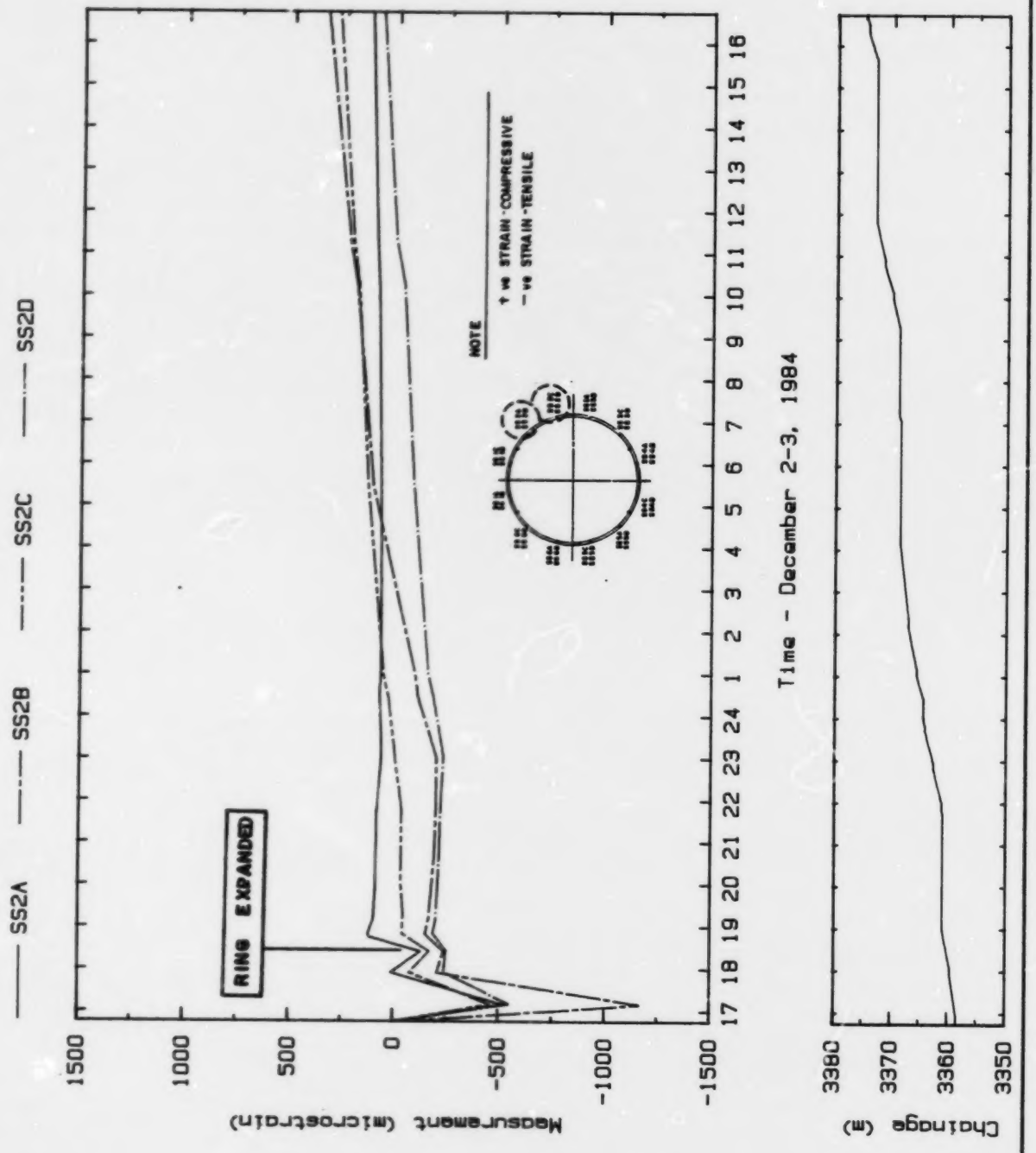
Drawn JLG

Chkd.

STEEL SET STRAIN MEASUREMENTS

Steel Set #2 - East upper side - ch. 3353m

FIGURE C.137



Date April 1985

Project No. 831-6014

Golder Associates

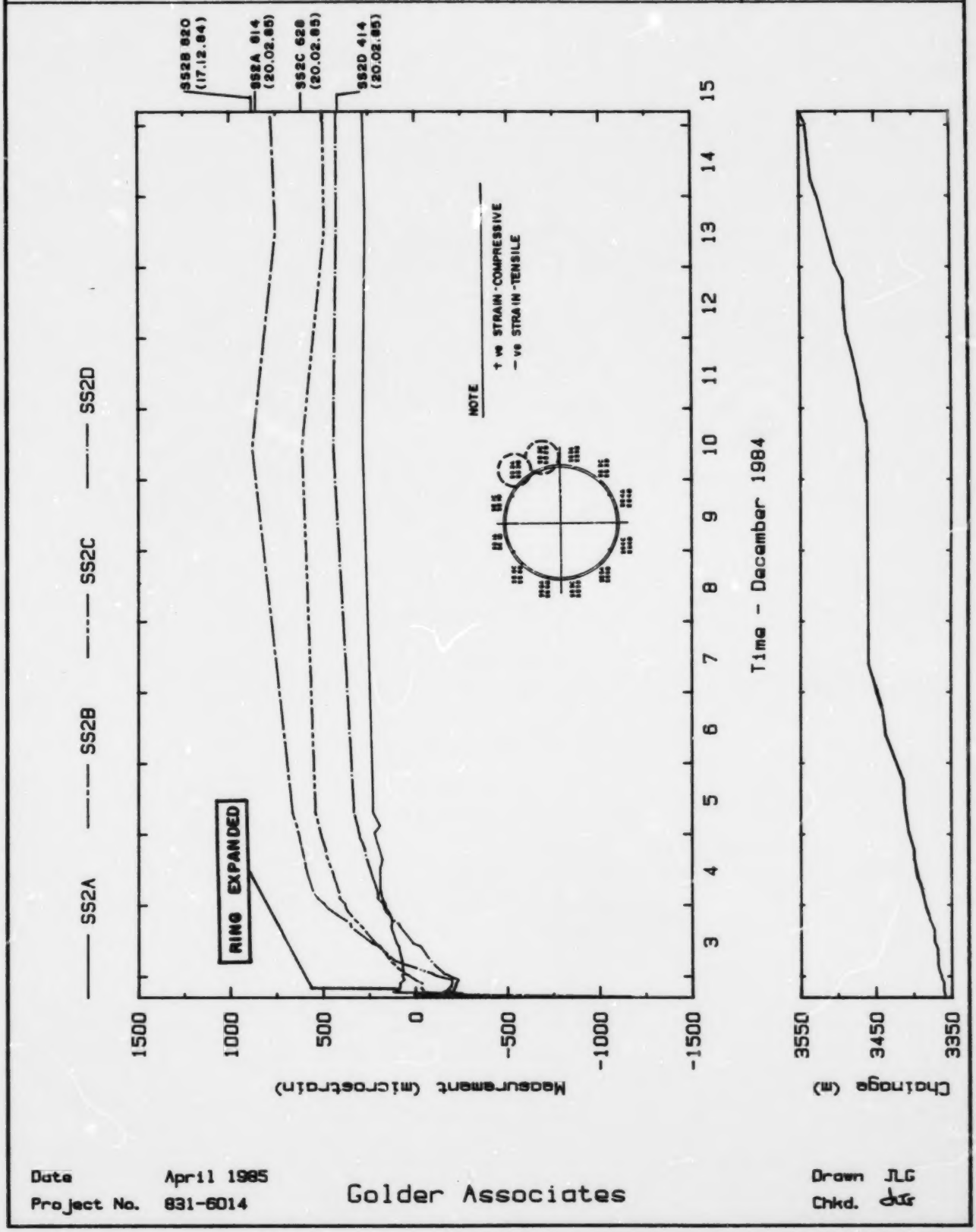
Drawn JLG

Chkd. dJS

STEEL SET STRAIN MEASUREMENTS

Steel Set #2 - East upper side - ch. 3353m

FIGURE C.138



Date April 1985

Project No. 831-6014

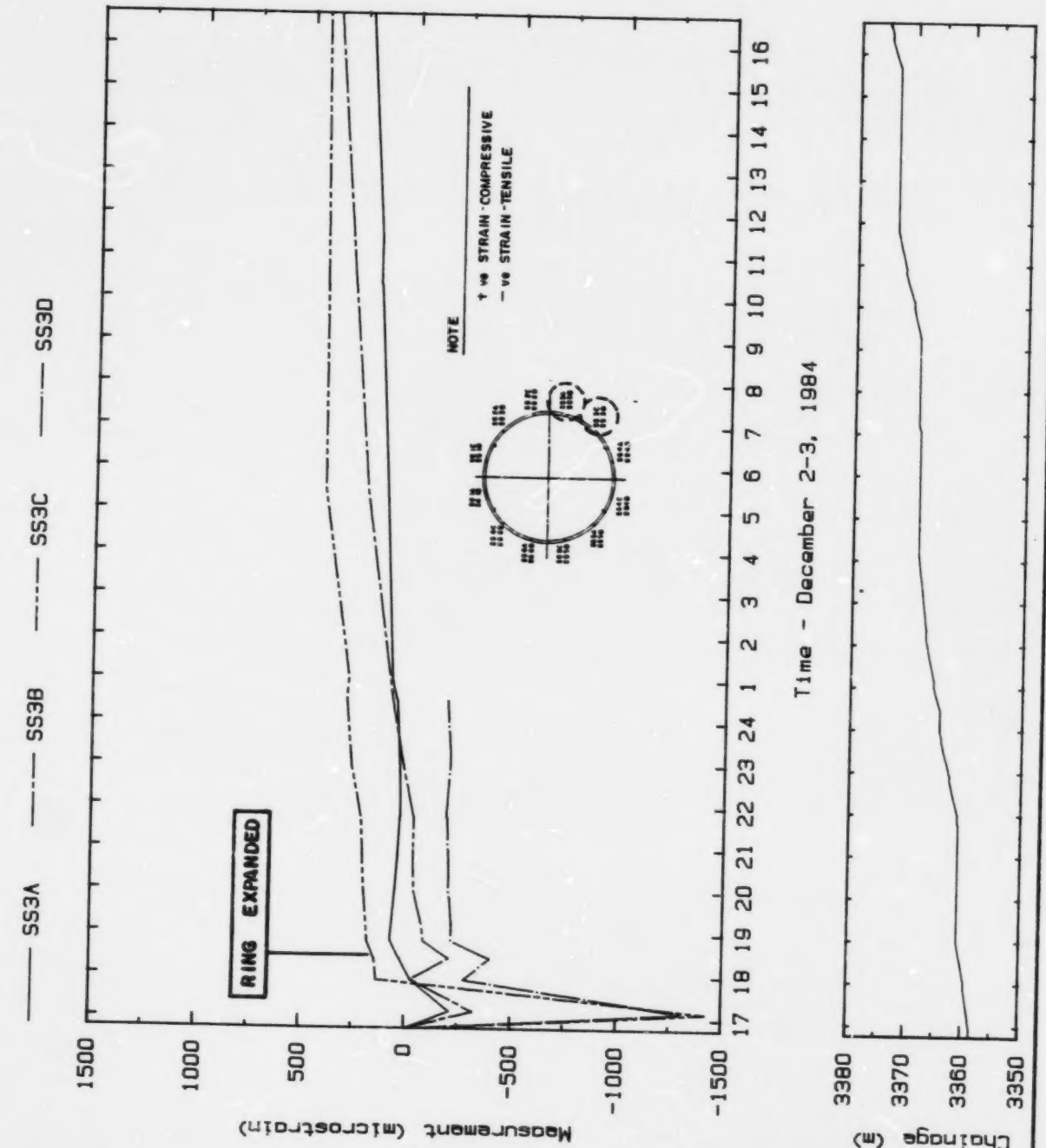
Golder Associates

Drawn JLG

Chkd. dgr

STEEL SET STRAIN MEASUREMENTS
Steel Set #3 - East lower side - ch. 3353m

FIGURE C.139



Date April 1985
Project No. 831-6014

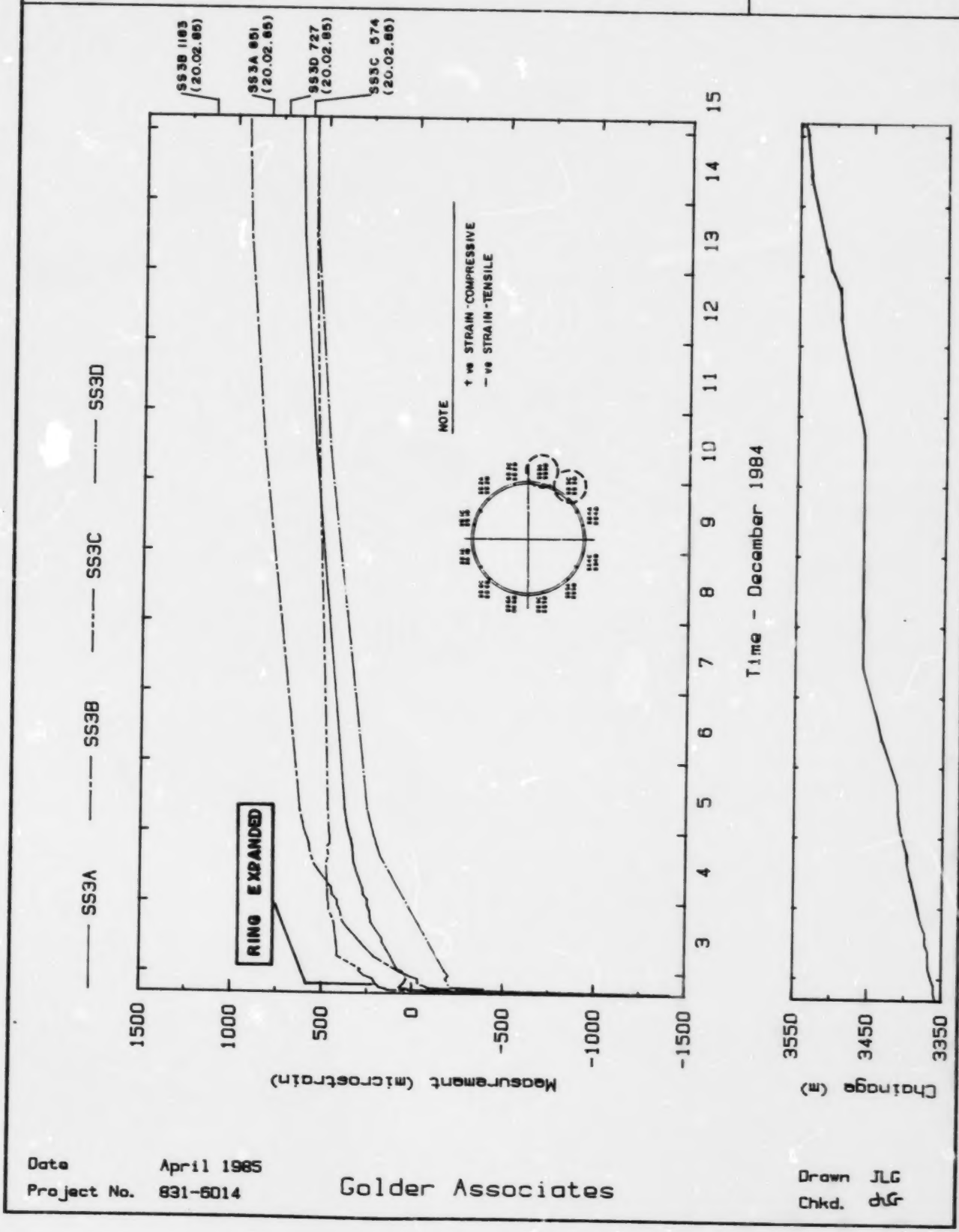
Golder Associates

Drawn JLG
Chkd. dgc

STEEL SET STRAIN MEASUREMENTS

Steel Set #3 - East lower side - ch. 3353m

FIGURE C.140



Date April 1985

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dhG

STEEL SET STRAIN MEASUREMENTS

Steel Set #4 - Invert - ch. 3353m

FIGURE C.141

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Golder Associates

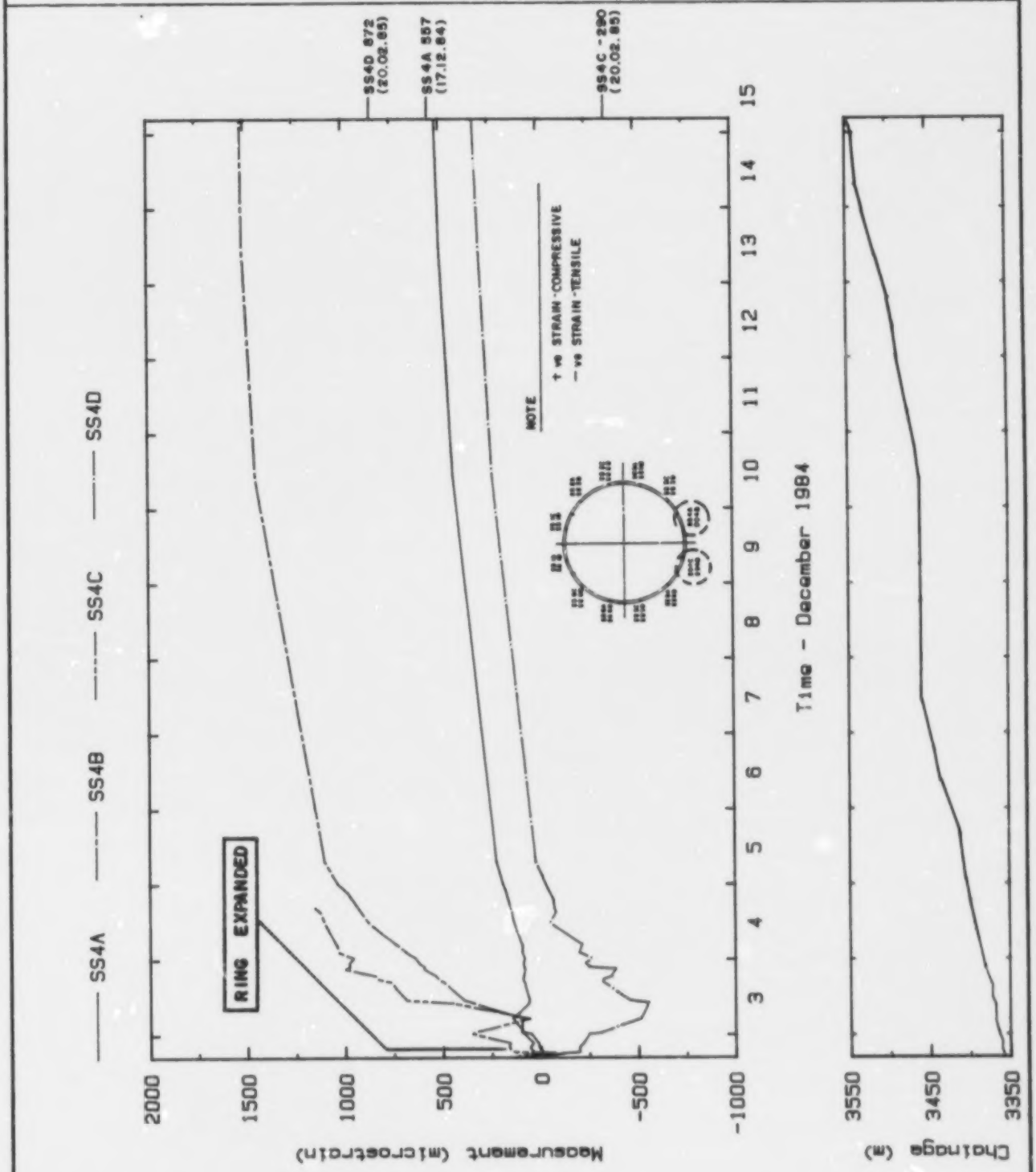
Drawn JLG

Chkd.

STEEL SET STRAIN MEASUREMENTS

Steel Set #4 - Invert - ch. 3353m

FIGURE C.142



Date April 1985

Project No. 831-6014

Golder Associates

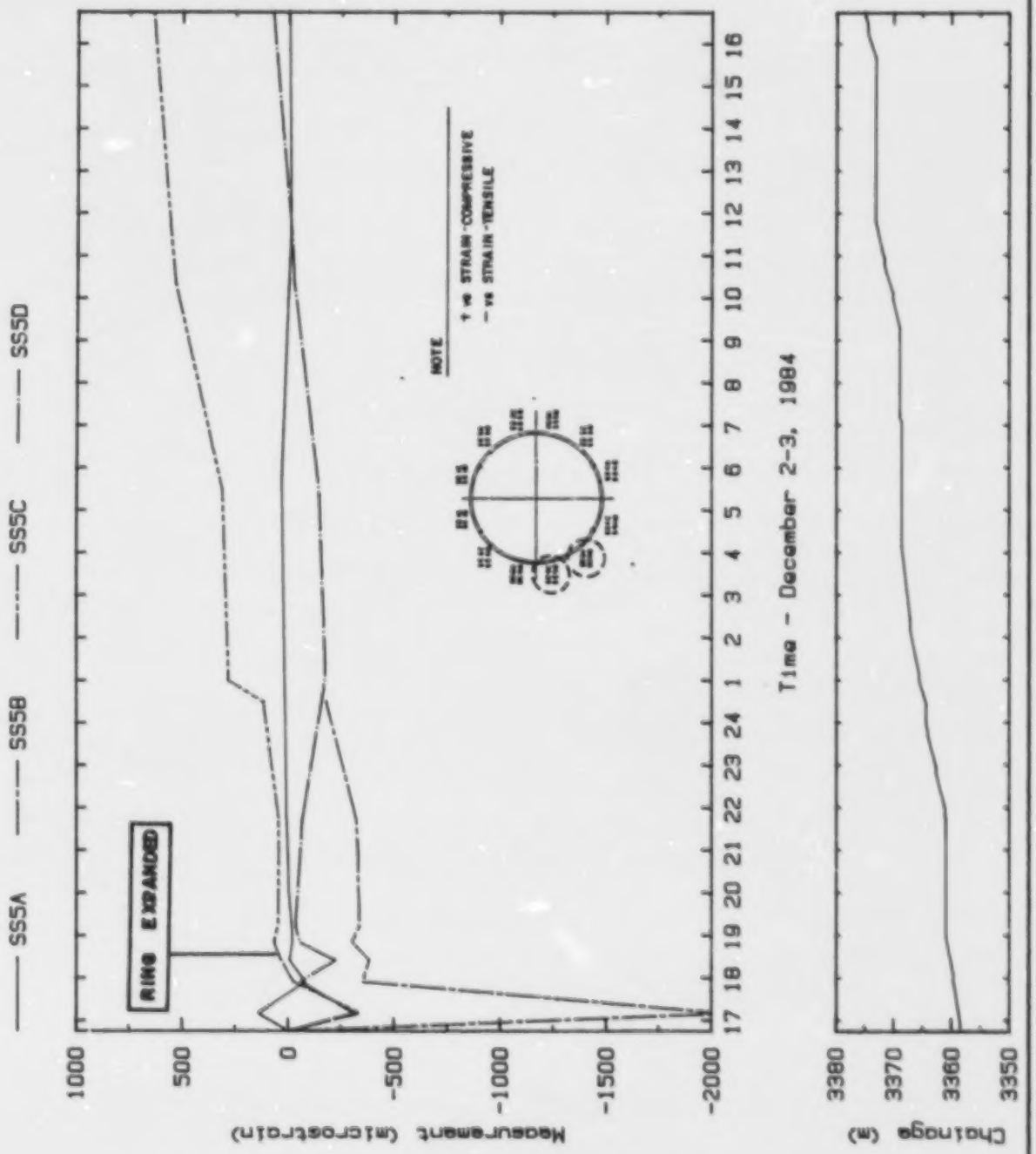
Drawn JLC

Chkd.

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - West lower side - ch. 3353m

FIGURE C.143



Date April 1985

Project No. 831-8014

Golder Associates

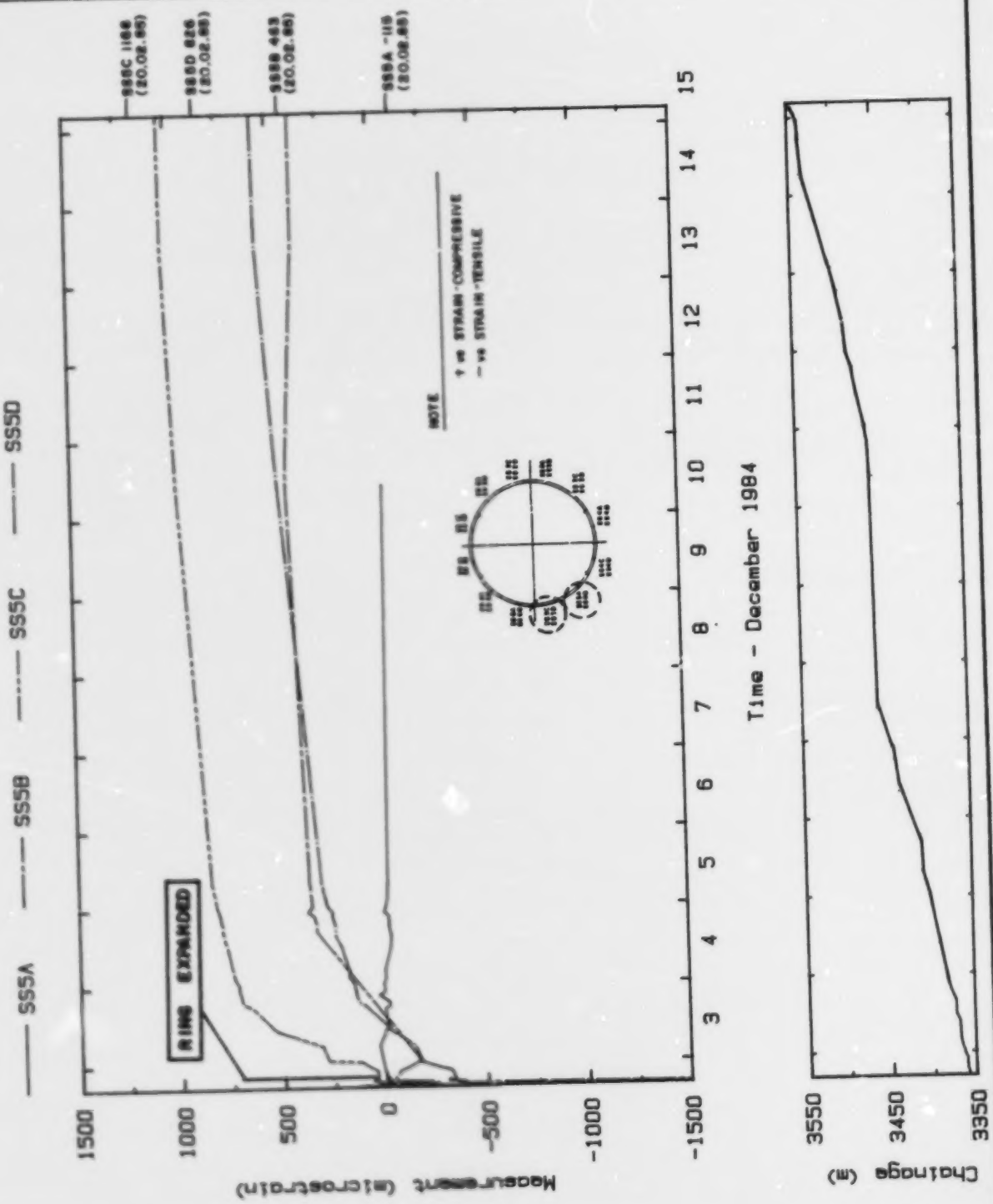
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #5 - West lower side - ch. 3353m

FIGURE C.144



Date April 1985

Project No. 831-6014

Golder Associates

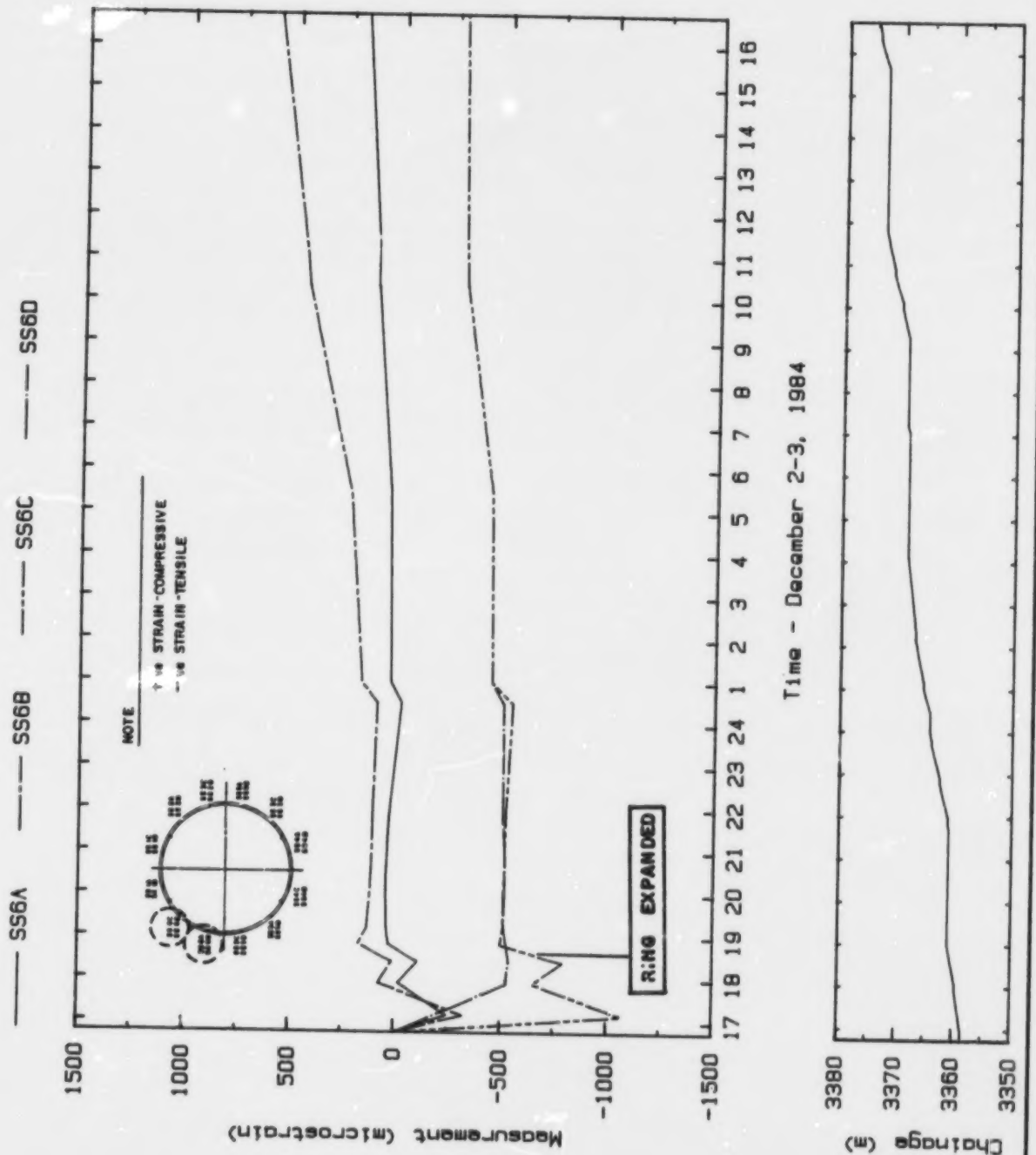
Drawn JLG

Chkd. JLG

STEEL SET STRAIN MEASUREMENTS

Steel Set #6 - West upper side - ch. 3353m

FIGURE C.145



Date April 1985

Project No. 831-6014

Golder Associates

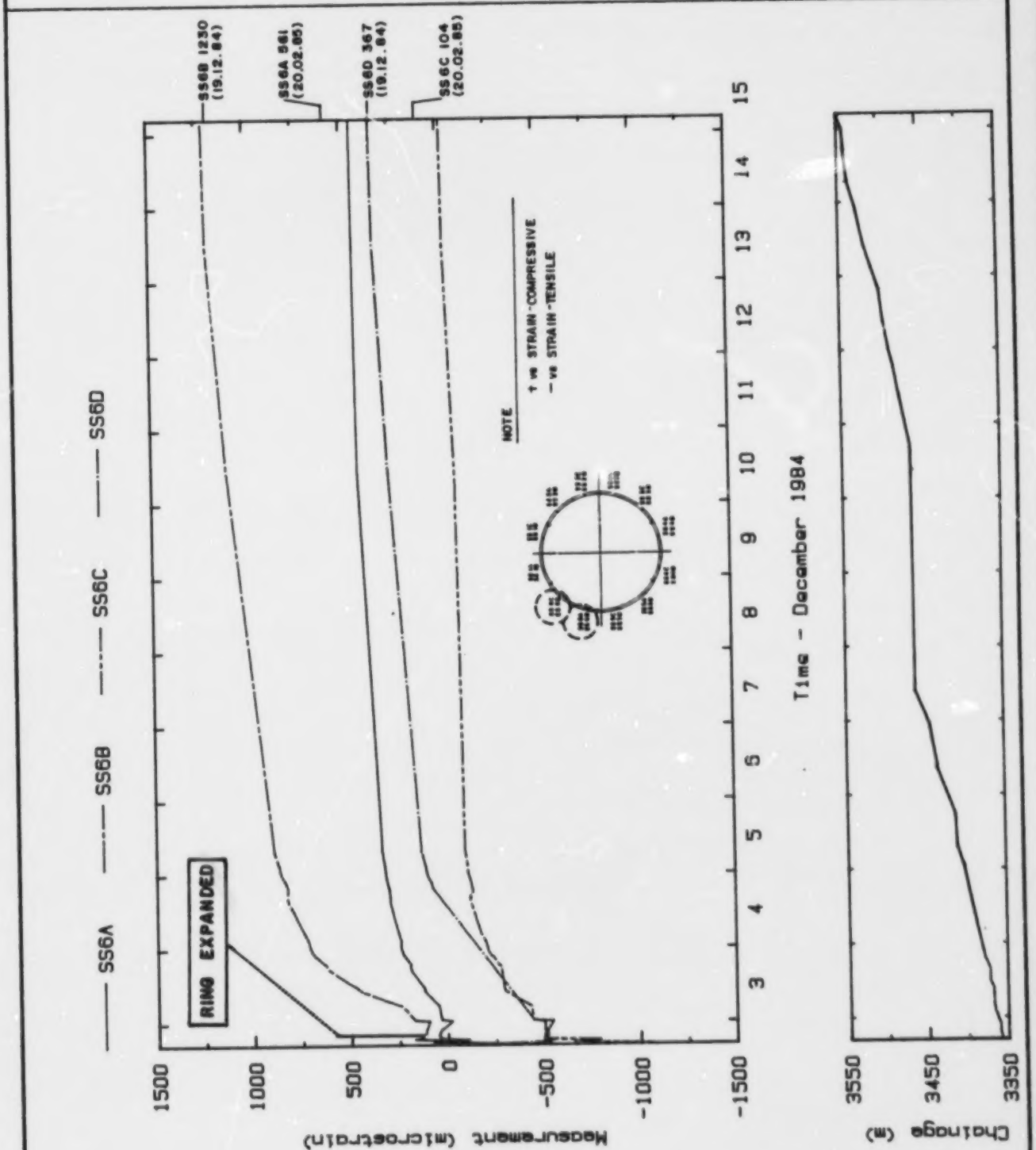
Drawn JLG

Chkd. DJG

STEEL SET STRAIN MEASUREMENTS

Steel Set #6 - West upper side - ch. 3353m

FIGURE C.146



Date April 1985

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. JG

APPENDIX C-4

STRESS CELL DATA AND PLOTS

Reduction of Stress Cell Data

The following data tables include instrument number, tunnel number, chainage, date installed and datum readings as the first reading column. The stress cell number reference is typically designated as SC1.

where SC1 - Circumferential stress cell on segment numbers 1 to 6 (see Figure I-5.1)

SC7 (Axial) - Axial stress cell at springline joint
SC7 - west side
SC8 - east side

For each set of readings the date, time and chainage of the tunnel are shown as well as the raw data under the reading column and the pressure calculated from the calibration charts shown in the column P MPa.

$$P(MPa) = G_f (r_o - r_1)$$

where G_f = Gauge factor from calibration graphs supplied with each unit

r_1 = reading taken on data shown

r_o = datum reading

The results of the pressure measurements for all the instrumentation array are presented on Figures C.147 to C.162, including both short and long term graphs. The radial and axial pressure measurements are grouped separately for each array of instrumentation. The pressure indicated on the graphs represents the average pressure measured over the area of the pressure cell. The position of the pressure cell (the terms "stress cell" and "pressure cell" are used interchangeably in the report) on the ring beam is highlighted on each graph and the final readings are shown on the right hand margin. The time of ring beam expansion was also indicated.

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	9.04	16.45	9.04	17.05	9.04	17.25	9.04	17.38	9.04	17.55
Tunnel ch.	989.70	989.70		990.50		990.70		991.00		991.20	
SC1	3262	3260	.01	3261	.00	3262	.00	3262	.00	3261	.00
SC2	3695	3691	.01	3691	.01	3691	.01	3692	.01	3692	.01
SC3	3416	3398	.06	3395	.07	3397	.06	3407	.03	3412	.01
SC4	3605	3605	.00	-	-	-	-	-	-	3609	-.02
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3365	.02	3365	.02	3365	.02	3364	.02	3361	.03
SC7 (Axial)	3484	3635	-.91	3649	-.99	3654	-1.02	3661	-1.06	3668	-1.10
Comments	Datum	Ram pressure 1900psi +/- 50 Rams in use 1, 2, 10, 13 to 24									

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	9.04	18.10	9.04	18.30	9.04	19.00	9.04	19.15	9.04	19.30
Tunnel ch.	989.70	991.20		991.40		992.20		992.50		992.70	
SC1	3262	3263	-.00	3261	.00	3260	.01	3261	.00	3260	.01
SC2	3695	3695	.00	3695	.00	3695	.00	3695	.00	3649	.14
SC3	3416	3414	.01	3423	-.02	3423	-.02	3424	-.03	3424	-.03
SC4	3605	3609	-.02	-	-	3618	-.05	3617	-.05	-	-
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3371	.00	3372	.00	3379	-.02	3374	-.00	3341	.09
SC7 (Axial)	3484	3490	-.04	3480	.02	3466	.11	3437	.29	2772	4.34
Comments	Datum	No load									

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	9.04	19.48	9.04	20.40	9.04	21.30	9.04	22.30	9.04	23.00
Tunnel ch.	989.70	992.70		993.00		994.20		995.20		995.70	
SC1	3262	3262	.00	3267	-.02	3267	-.02	3267	-.02	3266	-.01
SC2	3695	3661	.10	3664	.09	3691	.01	3691	.01	3692	.01
SC3	3416	3410	.02	3380	.12	3382	.11	3366	.17	3249	.55
SC4	3605	3585	.08	3614	-.04	-	-	3608	-.01	3604	.00
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3355	.05	3345	.08	3350	.06	3375	-.01	3378	-.02
SC7 (Axial)	3484	2973	3.12	3065	2.56	3231	1.54	3181	1.85	3313	1.04
Comments	Datum	No load setting ribs				Static load - head not turning				Static load - head not turning	

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	9.04	23.03	9.04	23.35	10.04	14.23	10.04	16.30	10.04	17.20
Tunnel ch.	989.70	995.70		996.00		1004.75		1004.80		1006.20	
SC1	3262	3267	-.02	3267	-.02	3267	-.02	3266	-.01	3267	-.02
SC2	3695	3691	.01	3693	.01	3693	.01	3695	.00	3693	.01
SC3	3416	3270	.48	3216	.66	3190	.75	3149	.88	3134	.93
SC4	3605	3582	.09	3586	.08	3571	.14	-	-	-	-
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3377	-.01	3377	-.01	3378	-.02	3375	-.01	3376	-.01
SC7 (Axial)	3484	3285	1.21	3254	1.40	3259	1.37	3282	1.23	3298	1.13
Comments	Datum	No load setting ribs				No load				Static load - head not turning	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	11.04	15.00	11.04	15.30	11.04	16.30	11.04	19.25	11.04	22.05
Tunnel ch.	989.70	1019.65		1020.00		1020.62		1023.42		1025.92	
SC1	3262	3266	-.01	3226	.11	3264	-.01	3266	-.01	3264	-.01
SC2	3695	3692	.01	3692	.01	3693	.01	3693	.01	3692	.01
SC3	3416	3163	.83	3168	.82	3212	.67	3276	.46	3219	.65
SC4	3605	3578	.11	3582	.09	3589	.06	3587	.07	3592	.05
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3377	-.01	3376	-.01	3376	-.01	3374	-.00	3376	-.01
SC7 (Axial)	3484	3298	1.13	3301	1.12	3289	1.19	3314	1.04	3270	1.31
Comments	Datum	No load									

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	12.04	7.10	12.04	17.15	12.04	21.10	13.04	3.35	13.04	7.22
Tunnel ch.	989.70	1029.00		1030.80		1033.70		1039.26		1042.84	
SC1	3262	3265	-.01	3264	-.01	3266	-.01	3264	-.01	3264	-.01
SC2	3695	3691	.01	3691	.01	3691	.01	3691	.01	3691	.01
SC3	3416	3413	.01	3410	.02	3358	.19	3386	.10	3382	.11
SC4	3605	3599	.02	3602	.01	3587	.07	-	14.60	3605	.00
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3372	.00	3372	.00	3374	-.00	3371	.00	3370	.01
SC7 (Axial)	3484	3267	1.32	3264	1.34	3248	1.44	3207	1.69	3202	1.72
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: April 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 984 e
Date installed 09/04/84 — Tunnel No. 2 — Sheet 4

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	13.04	16.45	13.04	20.45	14.04	5.18	14.04	7.08	16.04	17.00
Tunnel ch.	989.70	1045.80		1049.00		1058.00		1060.00		1061.80	
SC1	3262	3260	.01	3260	.01	3266	-.01	3264	-.01	3264	-.01
SC2	3695	3692	.01	3689	.02	3689	.02	3689	.02	3688	.02
SC3	3416	3345	.23	3371	.15	3358	.19	3355	.20	3356	.20
SC4	3605	-	-	3595	.03	-	-	-	-	3585	.07
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3366	.02	3366	.02	3367	.01	3367	.01	3354	.05
SC7 (Axial)	3484	3187	1.81	3183	1.84	3184	1.83	3181	1.85	3095	2.37
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	17.04	18.00	18.04	2.00	18.04	18.30	19.04	1.10	19.04	19.00
Tunnel ch.	989.70	1079.50		1086.00		1093.00		1098.00		1112.00	
SC1	3262	3266	-.01	3266	-.01	3266	-.01	3266	-.01	3264	-.01
SC2	3695	3687	.02	3687	.02	3687	.02	3686	.03	3688	.02
SC3	3416	3351	.21	3350	.22	3355	.20	3349	.22	3349	.22
SC4	3605	3585	.08	3585	.08	3583	.09	3585	.08	3585	.08
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3353	.05	3354	.05	3354	.05	3354	.05	3354	.05
SC7 (Axial)	3484	3067	2.54	3054	2.62	3063	2.57	3063	2.57	3056	2.61
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	20.04	1.30	23.04	22.45	24.04	6.00	24.04	23.04	25.04	3.00
Tunnel ch.	989.70	1117.30		1128.50		1133.30		1145.00		1149.50	
SC1	3262	3264	-.01	3264	-.01	3265	-.01	3266	-.01	3266	-.01
SC2	3695	3688	.02	3687	.02	3687	.02	3685	.03	3687	.02
SC3	3416	3345	.23	3348	.22	3347	.23	3345	.23	3345	.23
SC4	3605	3583	.09	3585	.08	3584	.09	3583	.09	3582	.09
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3354	.05	3353	.05	3353	.05	3350	.06	3350	.06
SC7 (Axial)	3484	3060	2.59	3052	2.64	3044	2.68	3035	2.74	3031	2.76
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	26.04	1.00	26.04	10.00	4.05	10.00	7.06	11.00	30.07	10.00
Tunnel ch.	989.70	1161.90		1169.15		1254.74		1522.35		1816.45	
SC1	3262	3266	-.01	3266	-.01	3265	-.01	3260	.01	3261	.00
SC2	3695	3688	.02	3687	.02	3685	.03	3683	.04	3677	.05
SC3	3416	3340	.25	3344	.24	3340	.25	3330	.28	3309	.35
SC4	3605	3583	.09	3582	.09	3582	.09	3579	.11	3573	.13
SC5	-	-	-	-	-	-	-	-	-	-	-
SC6	3372	3351	.06	3352	.06	3349	.07	3344	.08	3320	.15
SC7 (Axial)	3484	3030	2.77	3042	2.70	3023	2.81	2999	2.96	2820	4.05
Comments	Datum			No load		No load		No load		No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 984 m
Date installed 09/04/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04	31.07	10.00	21.09	14.00	28.11	10.00	20.02	12.00		
Tunnel ch.	989.70	1820.90		2413.15		3292.08		3579.78	1985		
SC1	3262	3261	.00	3262	.00	3261	.00	3261	.00		
SC2	3695	3677	.08	3675	.09	3678	.07	3680	.07		
SC3	3416	3309	.46	3305	.47	3309	.46	3315	.43		
SC4	3605	3573	.13	3571	.14	3574	.12	-	-		
SC5	-	-	-	-	-	-	-	-	-		
SC6	3372	3320	.21	3314	.23	3319	.21	3321	.20		
SC7 (Axial)	3484	2820	3.95	2820	3.95	2871	3.65	2912	3.40		
Comments	Datum	No load		No load		No load		No load			

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	9.04										
Tunnel ch.	989.70										
SC1	3262										
SC2	3695										
SC3	3416										
SC4	3605										
SC5	-										
SC6	3372										
SC7 (Axial)	3484										
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	28.05	10.50	28.05	13.47	28.05	15.30	28.05	15.45	28.05	16.15
Tunnel ch.	1427.97	1427.97		1427.97		1427.97		1428.17		1428.17	
SC1	3533	3533	.00	3533	.00	3532	.00	3533	.00	3529	.02
SC2	3365	3365	.00	3760	-1.74	3361	.02	3356	.04	3361	.02
SC3	3395	3395	.00	3396	-.00	3377	.08	3374	.09	3341	.23
SC4	3762	3762	.00	3761	.00	3766	-.02	3769	-.03	3768	-.02
SC5	3459	3459	.00	3461	-.01	3445	.06	3446	.06	3446	.06
SC6	3479	3479	.00	3473	.02	3468	.04	3472	.03	3469	.04
SC7 (Axial)	3647	3647	.00	3647	.00	3745	-.58	3736	-.53	3752	-.62
SC8 (Axial)	2832	2832	.00	2832	.00	2927	-.65	2926	-.64	2938	-.73
Comments	Datum	No load		No load		Mining 2000 psi		Under load head not turning			

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	28.05	16.25	28.05	16.50	28.05	17.24	28.05	17.50	28.05	18.00
Tunnel ch.	1427.97	1428.50		1429.10		1429.20		1429.30		1429.30	
SC1	3533	3532	.00	3529	.02	3520	.05	3524	.04	3534	-.00
SC2	3365	3359	.03	3349	.07	3348	.07	3349	.07	3364	.00
SC3	3395	3348	.20	3320	.32	3370	.11	3370	.11	3393	.01
SC4	3762	3740	.09	3753	.04	3765	-.01	3743	.08	3740	.09
SC5	3459	3450	.04	3442	.07	3442	.07	3446	.06	3460	-.00
SC6	3479	3465	.06	3465	.06	3457	.09	3463	.06	3474	.02
SC7 (Axial)	3647	3740	-.55	3771	-.74	3745	-.58	3737	-.54	3443	1.21
SC8 (Axial)	2832	2743	.61	2968	-.93	2946	-.78	2928	-.66	2837	-.03
Comments	Datum			Mining at 2000 psi						No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	28.05	19.03	28.05	19.33	28.05	19.40	28.05	20.07	28.05	20.55
Tunnel ch.	1427.97	1430.50		1430.97		1430.97		1430.97		1431.50	
SC1	3533	3546	-.05	3309	.89	3546	-.05	3545	-.05	3548	-.06
SC2	3365	3363	.01	3204	.71	3355	.04	3353	.05	3332	.15
SC3	3395	3398	-.01	3212	.78	3403	-.03	3393	.01	3400	-.02
SC4	3762	3777	-.06	3716	.18	3700	.25	3702	.24	3677	.34
SC5	3459	3465	-.03	3428	.14	3459	.00	3454	.02	3456	.01
SC6	3479	3469	.04	3445	.14	3454	.10	3450	.12	3450	.12
SC7 (Axial)	3647	3771	-.74	3769	-.73	3403	1.45	3385	1.56	2965	4.06
SC8 (Axial)	2832	2975	-.98	2443	2.66	2355	3.27	2330	3.44	2079	5.16
Comments	Datum			Expanding set		After release of expander		No load		No load	

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	28.05	21.15	28.05	22.00	28.05	22.40	29.05	1.00	29.05	1.50
Tunnel ch.	1427.97	1432.00		1432.47		1433.20		1433.30		1433.60	
SC1	3533	3546	-.05	3546	-.05	3546	-.05	3547	-.06	3546	-.05
SC2	3365	3337	.12	3327	.17	3287	.34	3290	.33	3299	.29
SC3	3395	3400	-.02	3390	.02	3376	.08	3372	.10	3329	.28
SC4	3762	3682	.32	3692	.28	3667	.38	3674	.35	3675	.35
SC5	3459	3451	.03	3440	.08	3434	.11	3440	.08	3430	.13
SC6	3479	3450	.12	3432	.19	3442	.15	3439	.16	3434	.18
SC7 (Axial)	3647	2993	3.89	3150	2.96	2857	4.70	2476	6.97	2350	7.72
SC8 (Axial)	2832	2099	5.02	1970	5.90	1700	7.75	1470	9.33	1426	9.63
Comments	Datum			No load						No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: June 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	29.05	4.40	29.05	6.00	29.05	6.15	29.05	7.30	29.05	16.35
Tunnel ch.	1427.97	1434.10		1435.47		1435.60		1437.17		1439.30	
SC1	3533	3541	-.03	3543	-.04	3543	-.04	3543	-.04	3550	-.07
SC2	3365	3281	.37	3300	.29	3282	.37	3311	.24	3319	.20
SC3	3395	3343	.22	3343	.22	3326	.29	3336	.25	3333	.26
SC4	3762	3670	.37	3678	.34	3671	.36	3693	.28	3725	.15
SC5	3459	3433	.11	3436	.10	3370	.39	3388	.31	3446	.06
SC6	3479	3434	.18	3428	.20	3421	.23	3422	.23	3433	.18
SC7 (Axial)	3647	2426	7.26	2380	7.54	2449	7.13	2430	7.24	2824	4.90
SC8 (Axial)	2832	1443	9.51	1528	8.93	-	-	-	-	2073	5.20
				No load							
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	29.05	17.20	29.05	18.10	29.05	18.50	29.05	19.35	29.05	20.25
Tunnel ch.	1427.97	1439.97		1441.47		1442.50		1442.97		1443.50	
SC1	3533	3548	-.06	3548	-.06	3551	-.07	3550	-.07	3548	-.06
SC2	3365	3320	.20	3338	.12	3313	.23	3336	.13	3311	.24
SC3	3395	3322	.31	3354	.18	3348	.20	3333	.26	3326	.29
SC4	3762	3723	.16	3720	.17	3712	.20	3713	.20	3708	.22
SC5	3459	3436	.10	3447	.05	3446	.06	3442	.07	3439	.09
SC6	3479	3432	.19	3427	.21	3430	.20	3426	.21	3426	.21
SC7 (Axial)	3647	2794	5.08	2612	6.16	2551	6.52	2561	6.46	2450	7.12
SC8 (Axial)	2832	2163	4.58	2211	4.25	2065	5.25	2172	4.52	2013	5.61
				No load				No load			
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: June 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1423 e
Date installed 24/05/84 — Tunnel No. 2 — Sheet 4

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	29.05	21.10	30.05	2.10	30.05	5.50	30.05	21.39	30.05	23.24
Tunnel ch.	1427.97	1444.00		1448.97		1452.70		1462.00		1464.50	
SC1	3533	3548	-.06	3548	-.06	3547	-.06	3547	-.06	3545	-.05
SC2	3365	3331	.15	3314	.22	3305	.26	3294	.31	3294	.31
SC3	3395	3320	.32	3353	.18	3315	.34	3363	.14	3273	.52
SC4	3762	3720	.17	3677	.34	3661	.41	3642	.48	3605	.63
SC5	3459	3439	.09	3449	.04	3428	.14	3401	.25	3302	.68
SC6	3479	3426	.21	3416	.25	3417	.25	3414	.26	3413	.26
SC7 (Axial)	3647	2499	6.83	1956	10.06	1738	11.36	1772	11.16	-	-
SC8 (Axial)	2832	2155	4.64	1894	6.43	1755	7.38	1556	8.74	1577	8.60
		No load									
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	31.05	2.35	31.05	5.55	31.05	22.52	1.06	2.00	1.06	6.00
Tunnel ch.	1427.97	1468.00		1471.50		1482.50		1485.50		1490.00	
SC1	3533	3547	-.06	3546	-.05	3542	-.04	3545	-.05	3541	-.03
SC2	3365	3293	.32	3290	.33	3295	.31	3293	.32	3291	.33
SC3	3395	3355	.17	3356	.17	3354	.18	3354	.18	3340	.23
SC4	3762	3650	.45	3649	.45	3646	.47	3642	.48	3636	.51
SC5	3459	3391	.30	3365	.41	3363	.42	3344	.50	3317	.62
SC6	3479	3412	.27	3411	.27	3410	.27	3410	.27	3410	.27
SC7 (Axial)	3647	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	2832	1550	8.78	1522	8.97	1510	9.06	1485	9.23	1471	9.32
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: June 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	2.06	2.30	2.06	5.45	4.06	19.00	4.06	22.30	6.06	6.30
Tunnel ch.	1427.97	1505.50		1508.00		1513.90		1517.00		1522.35	
SC1	3533	3542	-.04	3543	-.04	3539	-.02	3537	-.02	3543	-.04
SC2	3365	3285	.35	3282	.37	3277	.39	3276	.39	3281	.37
SC3	3395	3352	.18	3348	.20	3340	.23	3343	.22	3347	.20
SC4	3762	3635	.51	3634	.51	3623	.56	3621	.57	3652	.44
SC5	3459	3272	.82	3263	.85	3251	.91	3252	.90	3324	.59
SC6	3479	3410	.27	3410	.27	3407	.29	3405	.29	3413	.26
SC7 (Axial)	3647	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	2832	1385	9.91	1383	9.93	1247	10.86	1238	10.92	1308	10.44
Comments	Datum									No load	

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	6.06	17.00	7.06	10.30	12.06	9.00	15.06	2.15	15.06	5.30
Tunnel ch.	1427.97	1522.35		1522.35		1523.70		1569.00		1572.50	
SC1	3533	3543	-.04	3542	-.04	3541	-.03	3542	-.04	3542	-.04
SC2	3365	3278	.38	3277	.39	3275	.40	3280	.37	3280	.37
SC3	3395	3345	.21	3345	.21	3341	.23	3343	.22	3343	.22
SC4	3762	3647	.46	3645	.47	3642	.48	3646	.47	3646	.47
SC5	3459	3321	.60	3319	.61	3331	.56	3330	.56	3344	.50
SC6	3479	3413	.26	3412	.27	3413	.26	3414	.26	3414	.26
SC7 (Axial)	3647	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	2832	1272	10.69	1280	10.63	1267	10.72	1295	10.53	1298	10.51
Comments	Datum	No load		No load		No load					

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: June 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1423 m
Date installed 24/05/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05	28.06	21.00	31.07	10.00	21.09	14.00	28.11	10.00	20.02	12.00
Tunnel ch.	1427.97	1627.78		1820.90		2413.15		3292.08		3579.78	1985
SC1	3533	3543	-.04	3539	-.02	3535	-.01	3527	.02	3524	.04
SC2	3365	3296	.30	3280	.37	3266	.44	3249	.51	3522	-.69
SC3	3395	3334	.26	3321	.32	3314	.35	3276	.51	3217	.76
SC4	3762	3653	.44	3641	.49	3630	.53	3614	.59	3609	.61
SC5	3459	3408	.22	3391	.30	3326	.58	3252	.90	3235	.98
SC6	3479	3418	.24	3414	.26	3410	.27	3406	.29	3401	.31
SC7 (Axial)	3647	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	2832	1416	9.70	1407	9.76	1367	10.04	1285	10.60	-	-
		No load		No load		No load		No load		No load	
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	28.05										
Tunnel ch.	1427.97										
SC1	3533										
SC2	3365										
SC3	3395										
SC4	3762										
SC5	3459										
SC6	3479										
SC7 (Axial)	3647										
SC8 (Axial)	2832										
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	1.08	12.45	1.08	14.20	1.08	15.45	1.08	17.00	1.08	17.30
Tunnel ch.	1835.90	1835.90		1836.00		1837.40		1838.00		1838.50	
SC1	3446	3446	.00	3442	.01	3449	-.01	3450	-.01	3452	-.02
SC2	3443	3443	.00	3439	.01	3431	.04	3442	.00	3428	.05
SC3	3113	3113	.00	3055	.21	-	-	3132	-.07	2883	.83
SC4	3349	3349	.00	3337	.04	3345	.01	3364	-.05	3364	-.05
SC5	3086	3086	.00	3072	.05	3083	.01	3095	-.03	3085	.00
SC6	3114	3114	.00	3114	.00	3114	.00	3111	.01	3100	.05
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	3712	.00	3815	-.74	3771	-.42	3723	-.08	3732	-.14
Comments	Datum	No load				No load				No load	

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	1.08	17.44	1.08	18.48	1.08	19.05	1.08	19.49	1.08	20.40
Tunnel ch.	1835.90	1838.90		1840.50		1841.00		1841.10		1841.50	
SC1	3446	3452	-.02	3451	-.02	3451	-.02	3451	-.02	3451	-.02
SC2	3443	3428	.05	3410	.11	3410	.11	3408	.11	3406	.12
SC3	3113	-	-	-	-	-	-	-	-	-	-
SC4	3349	3337	.04	3278	.23	3285	.21	3273	.25	3252	.32
SC5	3086	3095	-.03	3076	.03	3073	.04	3073	.04	3071	.05
SC6	3114	3097	.06	3111	.01	3100	.05	3102	.04	3102	.04
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	3639	.52	3621	.65	3601	.80	3590	.88	3554	1.13
Comments	Datum					No load		No load			

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: August 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	1.08	20.50	1.08	21.20	1.08	21.56	1.08	22.35	1.08	23.15
Tunnel ch.	1835.90	1841.90		1842.20		1843.40		1843.70		1844.90	
SC1	3446	3452	-.02	3451	-.02	3451	-.02	3451	-.02	3451	-.02
SC2	3443	3407	.12	3402	.13	3407	.12	3401	.14	3401	.14
SC3	3113	-	-	3051	.22	3098	.05	3066	.17	3067	.17
SC4	3349	3277	.23	3242	.35	3254	.31	3244	.34	3252	.32
SC5	3086	3071	.05	3069	.06	3056	.10	308	9.00	3042	.14
SC6	3114	3100	.05	3107	.02	3100	.05	3105	.03	3098	.06
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	3599	.81	3521	1.37	3592	.86	3503	1.50	3570	1.02
		No load				No load				No load	
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	1.08	23.30	2.08	.30	2.08	1.10	2.08	1.40	2.08	2.20
Tunnel ch.	1835.90	1845.00		1846.00		1846.40		1846.50		1847.90	
SC1	3446	3450	-.01	3450	-.01	3451	-.02	3450	-.01	3450	-.01
SC2	3443	3398	.15	3402	.13	3398	.15	3400	.14	3400	.14
SC3	3113	3091	.08	3089	.09	3067	.17	3098	.05	3064	.18
SC4	3349	3251	.32	3249	.33	3257	.30	3262	.28	3255	.31
SC5	3086	3051	.11	3062	.08	3053	.11	3064	.07	3051	.11
SC6	3114	3102	.04	3092	.08	3091	.08	3092	.08	3086	.10
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	3484	1.64	3484	1.64	3539	1.24	3475	1.70	3518	1.39
						No load				No load	
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: August 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	2.08	2.50	2.08	3.40	2.08	4.00	2.08	5.40	2.08	6.00
Tunnel ch.	1835.90	1848.00		1849.40		1849.80		1850.90		1851.00	
SC1	3446	3450	-.01	3449	-.01	3450	-.01	3449	-.01	3450	-.01
SC2	3443	3401	.14	3397	.15	3398	.15	3397	.15	3397	.15
SC3	3113	3079	.12	3060	.19	3088	.09	3030	.30	3023	.32
SC4	3349	3266	.27	3264	.28	3268	.26	3252	.32	3257	.30
SC5	3086	3064	.07	3057	.09	3066	.06	3060	.08	3059	.09
SC6	3114	3087	.09	3077	.13	3077	.13	3076	.13	3078	.12
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	3482	1.65	3499	1.53	3460	1.81	3477	1.69	3463	1.79
				No load				No load			
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	2.08	7.40	2.08	19.45	2.08	22.30	3.08	18.00	3.08	21.00
Tunnel ch.	1835.90	1853.50		1855.50		1858.50		1874.00		1877.00	
SC1	3446	3450	-.01	3449	-.01	3447	-.00	3446	.00	3445	.00
SC2	3443	3396	.15	3388	.18	3386	.19	3370	.24	3366	.25
SC3	3113	3010	.37	3139	-.09	3123	-.04	3002	.40	3019	.34
SC4	3349	3278	.23	3247	.33	3251	.32	3259	.29	3251	.32
SC5	3086	3046	.13	3064	.07	3068	.06	3062	.08	3059	.09
SC6	3114	3077	.13	3064	.17	3059	.19	3049	.23	3047	.23
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	3460	1.81	3321	2.81	3326	2.77	3134	4.15	3088	4.48
		No load				No load					
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 4

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	6.08	15.04	6.08	15.30	7.08	1.20	7.08	1.45	7.08	5.25
Tunnel ch.	1835.90	1889.10		1889.74		1896.00		1896.20		1899.00	
SC1	3446	3442	.01	3442	.01	3442	.01	3442	.01	3443	.01
SC2	3443	3360	.27	3360	.27	3359	.27	3359	.27	3359	.27
SC3	3113	2988	.45	2987	.45	2988	.45	2987	.45	2975	.50
SC4	3349	3209	.46	3209	.46	3200	.48	3200	.48	3197	.49
SC5	3086	3043	.14	3042	.14	3042	.14	3042	.14	3041	.15
SC6	3114	3040	.26	3041	.25	3041	.25	3040	.26	3040	.26
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	2930	5.61	2932	5.60	2925	5.65	2925	5.65	2915	5.72
				No load		No load					
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	7.08	6.04	7.08	18.32	7.08	21.46	8.08	1.15	8.08	5.30
Tunnel ch.	1835.90	1899.50		1906.50		1909.20		1913.20		1916.70	
SC1	3446	3442	.01	3441	.02	3441	.02	3441	.02	3441	.02
SC2	3443	3359	.27	3359	.27	3359	.27	3359	.27	3359	.27
SC3	3113	2975	.50	2974	.50	2970	.51	2973	.50	2974	.50
SC4	3349	3197	.47	3195	.50	3199	.49	3199	.49	3197	.49
SC5	3086	3041	.15	3038	.16	3028	.19	3038	.16	3039	.15
SC6	3114	3040	.26	3041	.25	3041	.25	3041	.25	3040	.26
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	2914	5.73	2898	5.84	2900	5.83	2887	5.92	2888	5.92
		No load									
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: August 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1831 e
Date installed 01/08/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	8.08	18.23	8.08	22.44	9.08	1.30	9.08	6.20	9.08	21.02
Tunnel ch.	1835.90	1921.80		1924.30		1926.70		1930.70		1937.20	
SC1	3446	3440	.02	3440	.02	3440	.02	3440	.02	3439	.02
SC2	3443	3358	.28	3358	.28	3358	.28	3358	.28	3356	.28
SC3	3113	2972	.51	2972	.51	2970	.51	2970	.51	2970	.51
SC4	3349	3199	.49	3200	.48	3200	.48	3199	.49	3199	.49
SC5	3086	3030	.18	3037	.16	3037	.16	3037	.16	3034	.17
SC6	3114	3039	.26	3038	.26	3037	.27	3037	.27	3035	.27
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	2870	6.05	2864	6.09	2859	6.12	-	-	2835	6.30
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	9.08	22.30	10.08	.45	10.08	5.20	10.08	21.09	10.08	23.31
Tunnel ch.	1835.90	1938.50		1940.50		1945.20		1953.70		1955.50	
SC1	3446	3439	.02	3439	.02	3439	.02	3439	.02	3437	.03
SC2	3443	3358	.28	3358	.28	3356	.28	3356	.28	3356	.28
SC3	3113	2971	.51	2969	.52	2970	.51	2970	.51	2968	.52
SC4	3349	3199	.49	3202	.48	3201	.48	3196	.50	3196	.50
SC5	3086	3029	.18	3019	.22	3027	.19	3018	.22	3024	.20
SC6	3114	3034	.28	3035	.27	3034	.28	3035	.27	3035	.27
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	2837	6.28	2833	6.31	2829	6.34	2814	6.45	2809	6.48
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: August 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 1831 m
Date installed 01/08/84 — Tunnel No. 2 — Sheet 6

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	11.08	1.00	11.08	6.00	13.08	10.45	14.08	11.00	15.08	10.45
Tunnel ch.	1835.90	1956.50		1960.30		1960.97		1973.59		1991.07	
SC1	3446	3439	.02	3436	.04	3434	.04	3433	.05	3433	.05
SC2	3443	3356	.28	3356	.28	3355	.29	3355	.29	3355	.29
SC3	3113	2968	.52	2969	.52	2968	.52	2967	.53	2968	.52
SC4	3349	3197	.49	3196	.50	3192	.51	3190	.52	3187	.53
SC5	3086	3024	.20	3027	.19	3025	.20	3025	.20	3028	.19
SC6	3114	3034	.28	3033	.28	3032	.28	3031	.29	3031	.29
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	2807	6.50	2802	6.53	2756	6.86	2744	6.95	2733	7.03
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	1.08	16.08	13.30	17.08	12.15	17.09	14.00	28.11	10.00	20.02	12.00
Tunnel ch.	1835.90	1997.47		2003.37		2352.00		3292.08		3579.78	1985
SC1	3446	3434	.04	3431	.05	3423	.08	3420	.09	3420	.09
SC2	3443	3355	.29	3355	.29	3354	.29	3354	.29	3354	.29
SC3	3113	2968	.52	2966	.53	2971	.51	2978	.49	-	-
SC4	3349	3188	.52	3183	.54	3198	.49	3400	-.17	3400	-.17
SC5	3086	3027	.19	3010	.25	3018	.22	3019	.22	3024	.20
SC6	3114	3031	.29	3030	.29	3026	.31	3015	.34	3015	.34
SC7 (Axial)	-	-	-	-	-	-	-	-	-	-	-
SC8 (Axial)	3712	2732	7.04	2700	7.27	2650	7.63	2621	7.83	2576	8.16
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: August 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 1

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	2.12	16.45	2.12	17.10	2.12	18.00	2.12	18.20	2.12	18.45
Tunnel ch.	3358.45	3358.45		3358.50		3359.80		3360.00		3360.00	
SC1	3269	3269	.00	3267	.01	3268	.00	3270	-.00	3156	.40
SC2	3473	3473	.00	3427	.15	3450	.08	3464	.03	3437	.12
SC3	3411	3411	.00	3299	.36	3407	.01	3449	-.12	3381	.10
SC4	3486	3486	.00	3470	.06	3505	-.07	3512	-.09	3504	-.06
SC5	3175	3175	.00	3161	.05	3174	.00	3204	-.09	3140	.11
SC6	3342	3342	.00	3336	.02	3335	.02	3342	.00	3330	.04
SC7 (Axial)	3480	3480	.00	3475	.03	3176	2.05	2978	3.39	2851	4.25
SC8 (Axial)	3353	3353	.00	3343	.07	3195	1.09	3036	2.19	2956	2.74
Comments	Datum	No load				No load				Expanding set	

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	2.12	18.48	2.12	18.50	2.12	19.15	2.12	20.00	2.12	20.40
Tunnel ch.	3358.45	3360.60		3360.60		3361.00		3361.00		3361.00	
SC1	3269	3270	-.00	3262	.02	3240	.10	3243	.09	3242	.09
SC2	3473	3468	.02	3470	.01	3474	-.00	3473	.00	3472	.00
SC3	3411	3417	-.02	3441	-.10	3436	-.08	3422	-.04	3416	-.02
SC4	3486	3472	.05	3463	.08	3475	.04	3491	-.02	3492	-.02
SC5	3175	3193	-.06	3203	-.09	3196	-.07	3194	-.06	3193	-.06
SC6	3342	3341	.00	3333	.03	3333	.03	3336	.02	3335	.02
SC7 (Axial)	3480	2720	5.13	2729	5.07	2745	4.96	2737	5.02	2734	5.04
SC8 (Axial)	3353	2909	3.07	2797	3.84	2837	3.57	2823	3.66	2851	3.47
Comments	Datum	After expansion of set				No load		No load		No load	

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: December 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 2

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	2.12	21.45	2.12	23.00	3.12	.37	3.12	1.00	3.12	5.30
Tunnel ch.	3358.45	3361.00		3362.00		3364.00		3365.00		3365.00	
SC1	3269	3246	.08	3255	.05	3246	.08	325'	.06	3244	-.22
SC2	3473	3466	.02	3452	.07	3450	.08	3447	.09	3437	-.30
SC3	3411	3436	-.08	3423	-.04	3422	-.04	3414	-.01	3395	.57
SC4	3486	3477	.03	3490	-.01	3477	.03	3482	.01	3431	-.54
SC5	3175	3202	-.09	3177	-.01	3146	.09	-	-	3154	.07
SC6	3342	3324	.06	3333	.03	3305	.12	3315	.09	3276	.06
SC7 (Axial)	3480	2877	4.07	2886	4.01	2663	5.51	2574	6.12	2294	4.07
SC8 (Axial)	3353	2789	3.90	2778	3.97	2748	4.18	2708	4.46	2363	3.90
								No load		No load	
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	3.12	10.25	3.12	11.14	3.12	17.00	3.12	18.00	3.12	19.00
Tunnel ch.	3358.45	3369.25		3372.45		3374.95		3376.45		3377.95	
SC1	3269	3235	.12	3232	.13	-	-	-	-	-	-
SC2	3473	3433	.13	3433	.13	3423	.17	3422	.17	3422	.17
SC3	3411	3387	.08	3390	.07	3380	.10	3382	.09	3380	.10
SC4	3486	3427	.20	3393	.32	3355	.45	3345	.48	3347	.48
SC5	3175	3144	.10	3139	.12	3144	.10	3133	.14	3135	.13
SC6	3342	3270	.23	3260	.26	3267	.24	3259	.27	3261	.26
SC7 (Axial)	3480	2172	8.83	2125	9.15	1915	10.56	1928	10.48	1886	10.76
SC8 (Axial)	3353	2184	8.08	2098	8.67	1840	10.45	1820	10.59	1798	10.75
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 3

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	3.12	21.15	3.12	22.00	3.12	23.05	4.12	.55	4.12	2.30
Tunnel ch.	3358.45	3380.65		3382.15		3383.65		3384.00		3386.65	
SC1	3269	-	-	-	-	-	-	-	-	-	-
SC2	3473	3421	.17	3418	.18	3421	.17	3418	.18	3417	.19
SC3	3411	3380	.10	3375	.12	3377	.11	3376	.11	3375	.12
SC4	3486	3326	.55	3327	.55	3312	.60	3305	.62	3293	.66
SC5	3175	3143	.10	3136	.13	3135	.13	3138	.12	3132	.14
SC6	3342	3264	.25	3262	.26	3260	.26	-	-	-	-
SC7 (Axial)	3480	1866	10.89	1869	10.87	1863	10.91	1860	10.94	1803	11.32
SC8 (Axial)	3353	1751	11.07	1719	11.29	1698	11.44	1670	11.63	1617	12.00
										No load	
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	4.12	5.00	4.12	12.50	4.12	15.35	4.12	16.40	4.12	18.40
Tunnel ch.	3358.45	3388.15		3392.65		3395.65		3397.15		3398.65	
SC1	3269	-	-	3264	.02	3200	.25	3197	.26	3197	.26
SC2	3473	3417	.19	3414	.20	3413	.20	3412	.20	3412	.20
SC3	3411	3369	.14	3367	.14	3370	.13	3369	.14	3369	.14
SC4	3486	3293	.66	3255	.79	3248	.82	3244	.83	3244	.83
SC5	3175	3135	.13	3137	.12	3130	.15	3131	.14	3131	.14
SC6	3342	-	-	3260	.26	3251	.29	3251	.29	3251	.29
SC7 (Axial)	3480	1807	11.29	1760	11.61	1717	11.90	1719	11.89	1725	11.85
SC8 (Axial)	3353	1588	12.20	1435	13.25	1426	13.32	1412	13.41	1403	13.47
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: December 1984 — Golder Associates — Project No. 831-6014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 4

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	4.12	19.45	4.12	21.30	4.12	22.40	5.12	.30	5.12	3.00
Tunnel ch.	3358.45	3399.00		3399.50		3401.15		3403.15		3404.65	
SC1	3269	3196	.26	3195	.26	3195	.26	3195	.26	3194	.27
SC2	3473	3412	.20	3412	.20	3411	.21	3410	.21	3410	.21
SC3	3411	3369	.14	3369	.14	3367	.14	3367	.14	3366	.14
SC4	3486	3242	.84	3239	.85	3237	.86	3242	.84	3240	.85
SC5	3175	3131	.14	3131	.14	3132	.14	3131	.14	3131	.14
SC6	3342	3249	.30	3249	.30	3248	.30	3247	.30	3247	.30
SC7 (Axial)	3480	1725	11.85	1709	11.95	1691	12.08	1675	12.18	1666	12.24
SC8 (Axial)	3353	1399	13.50	1382	13.62	1366	13.73	1358	13.79	1341	13.90
								No load			
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	5.12	7.30	10.12	9.50	13.12	11.30	17.12	19.00	19.12	9.30
Tunnel ch.	3358.45	3409.15		3457.76		3516.66		3549.53		3575.03	
SC1	3269	3192	.27	3187	.29	3165	.37	3163	.38	3156	.40
SC2	3473	3410	.21	3406	.23	3406	.23	3407	.22	3408	.22
SC3	3411	3365	.15	3353	.19	3354	.18	3350	.20	3349	.20
SC4	3486	3234	.87	3529	-.15	3529	-.15	3530	-.15	3530	-.15
SC5	3175	3131	.14	3127	.16	3127	.16	3126	.16	3124	.17
SC6	3342	3246	.31	3239	.33	3226	.37	3227	.37	3229	.36
SC7 (Axial)	3480	1639	12.43	1456	13.66	1393	14.09	1371	14.24	1383	14.15
SC8 (Axial)	3353	1309	14.12	1051	15.91	-	-	-	-	-	-
Comments	Datum										

Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: December 1984 — Golder Associates — Project No. 831-4014

Donkin-Morien Development Project
Rock Support Interaction Study
STRESS CELL DATA

Instrument Section Stress Cells on Steel Sets — Chainage 3353 m
Date installed 01/12/84 — Tunnel No. 2 — Sheet 5

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12	20.02	12.00								
Tunnel ch.	3358.45	3579.78	1985								
SC1	3269	3137	.47								
SC2	3473	3410	.21								
SC3	3411	3339	.23								
SC4	3486	3531	-.15								
SC5	3175	3124	.17								
SC6	3342	3231	.36								
SC7 (Axial)	3480	1280	14.85								
SC8 (Axial)	3353	-	-								
Comments	Datum										

	Reading	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa	Reading	P MPa
Date/Time	2.12										
Tunnel ch.	3358.45										
SC1	3269										
SC2	3473										
SC3	3411										
SC4	3486										
SC5	3175										
SC6	3342										
SC7 (Axial)	3480										
SC8 (Axial)	3353										
Comments	Datum										

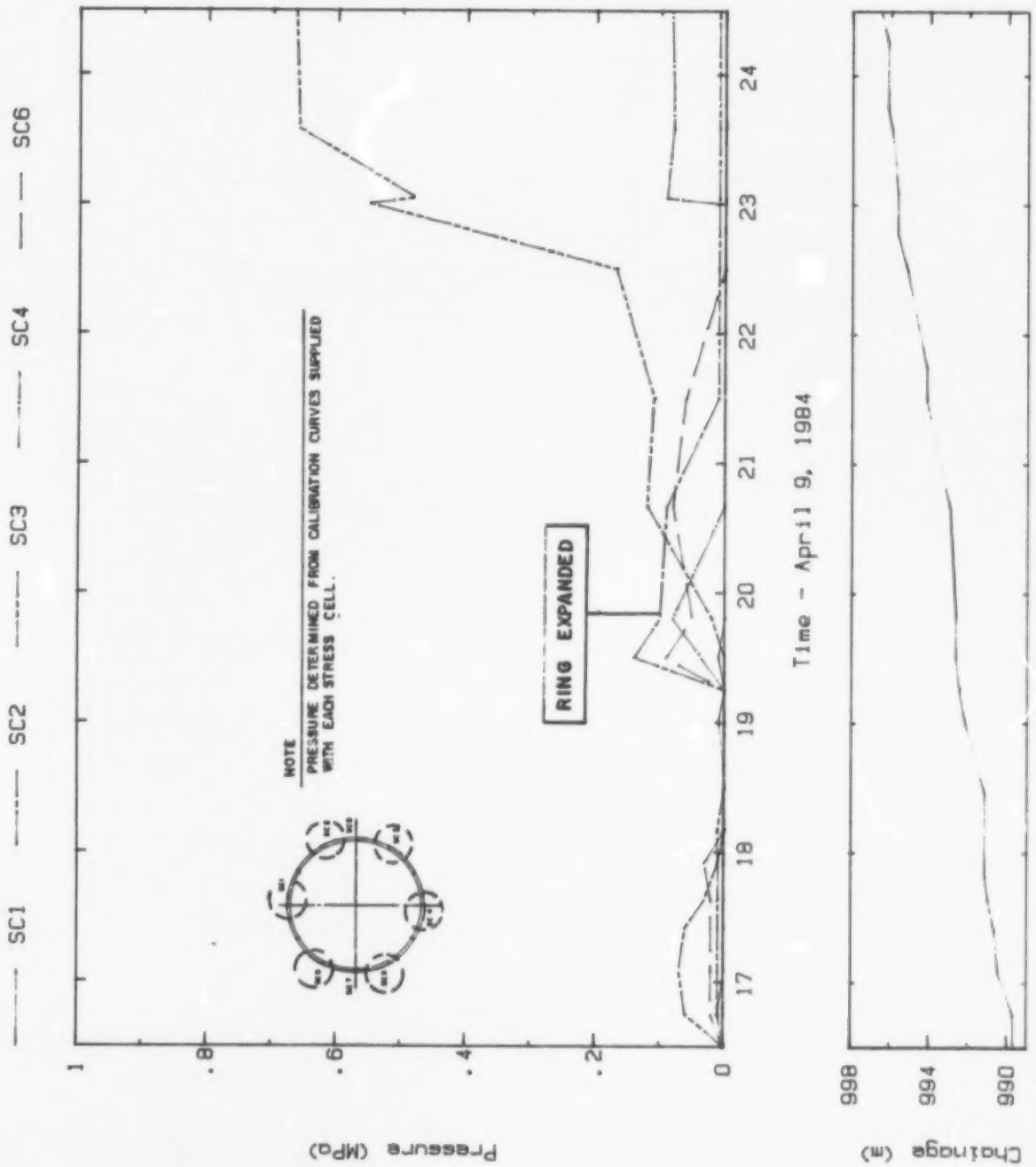
Notes: Readings taken while TBM driving unless otherwise noted in comments

Date: December 1984 — Golder Associates — Project No. 831-6014

STEEL SEI STRESS CELLS

Circumferential Cells - ch. 984m

FIGURE C.147



Date November 1984

Project No. 831-6014

Golder Associates

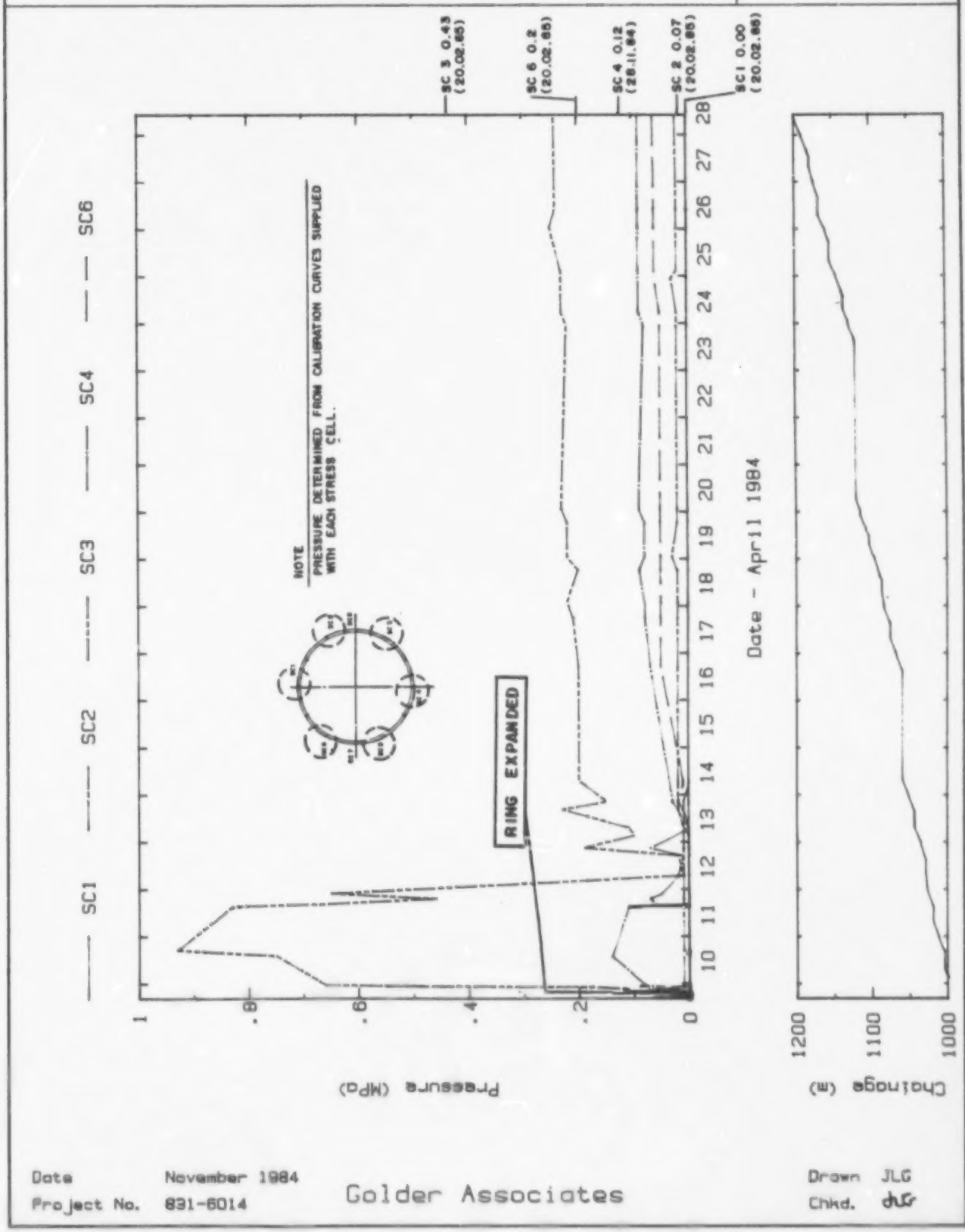
Drawn JLG

Chkd.

STEEL SET STRESS CELLS

Circumferential Cells - ch. 984m

FIGURE C.148



Date November 1984

Project No. 831-6014

Golder Associates

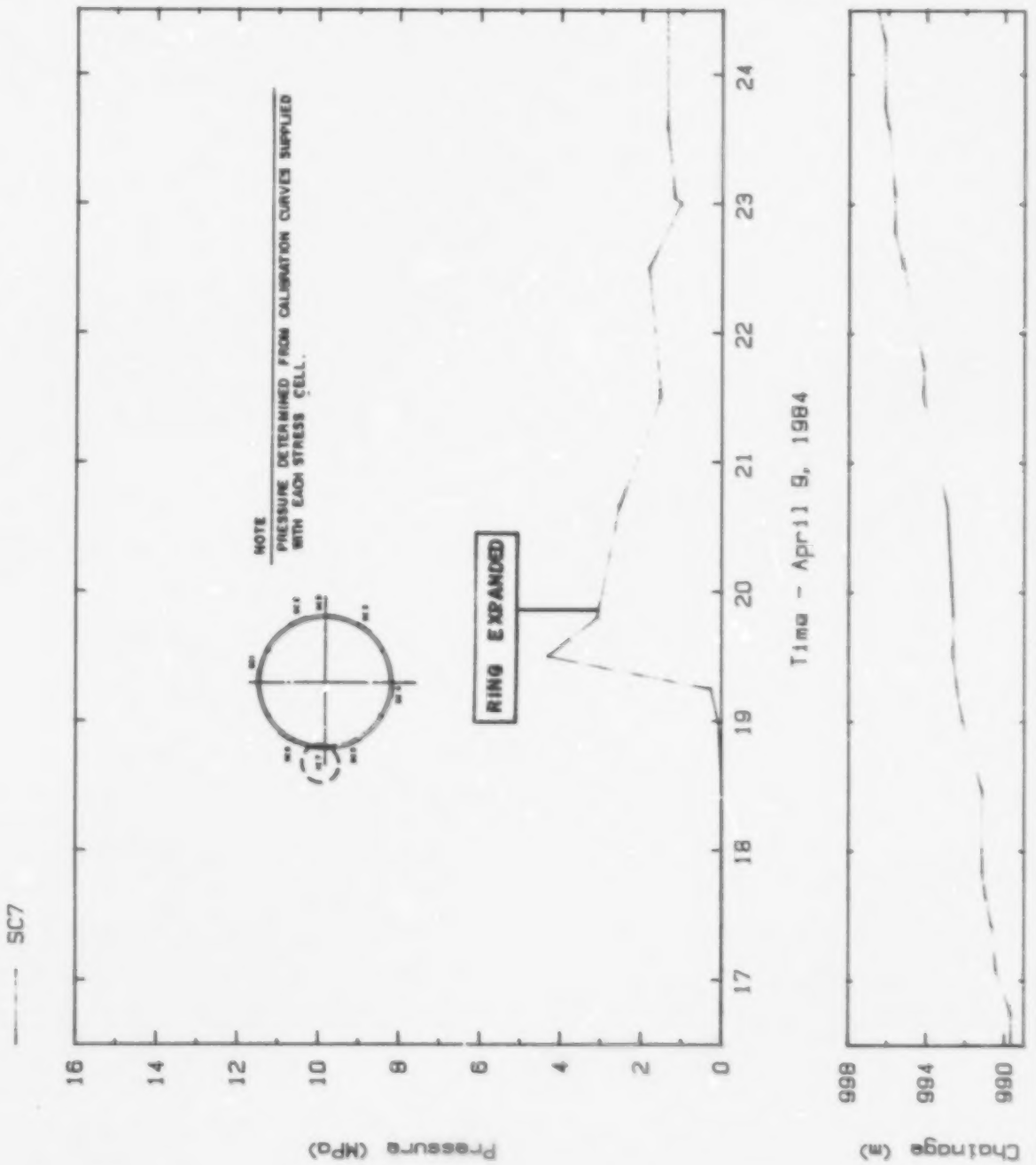
Drawn JLG

Chkd. dlg

STEEL SET STRESS CELLS

Axial Cells - ch. 984m

FIGURE C.149



Date November 1984

Project No. 831-6014

Golder Associates

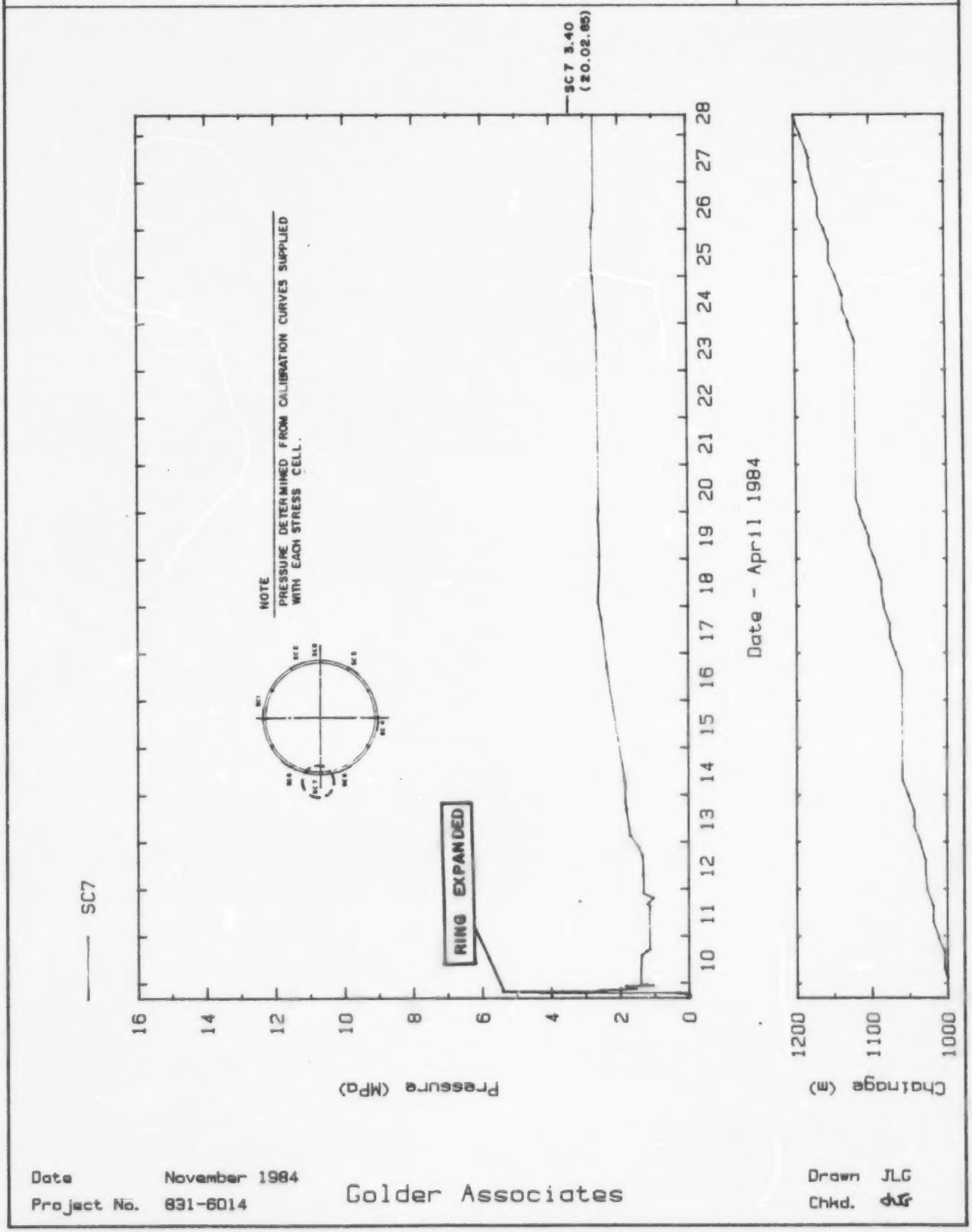
Drawn JLC

Chkd. JLC

STEEL SET STRESS CELLS

Axial Cells - ch. 984m

FIGURE **C.150**



Date November 1984

Project No. 831-6014

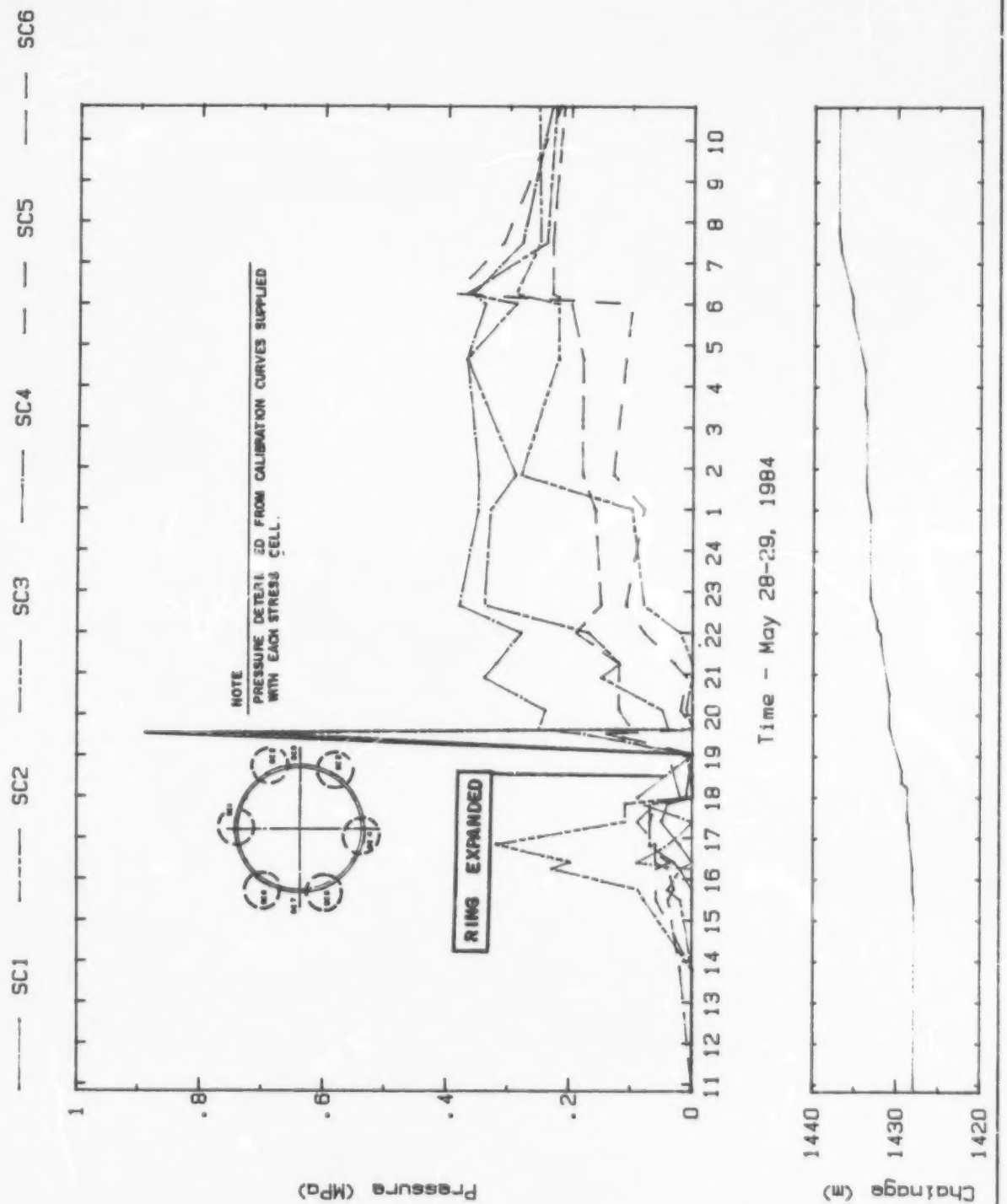
Golder Associates

Drawn JLG

Chkd.

STEEL SET STRESS CELLS
Circumferential Cells - ch. 1423m

FIGURE C.151



Date November 1984
Project No. 831-6014

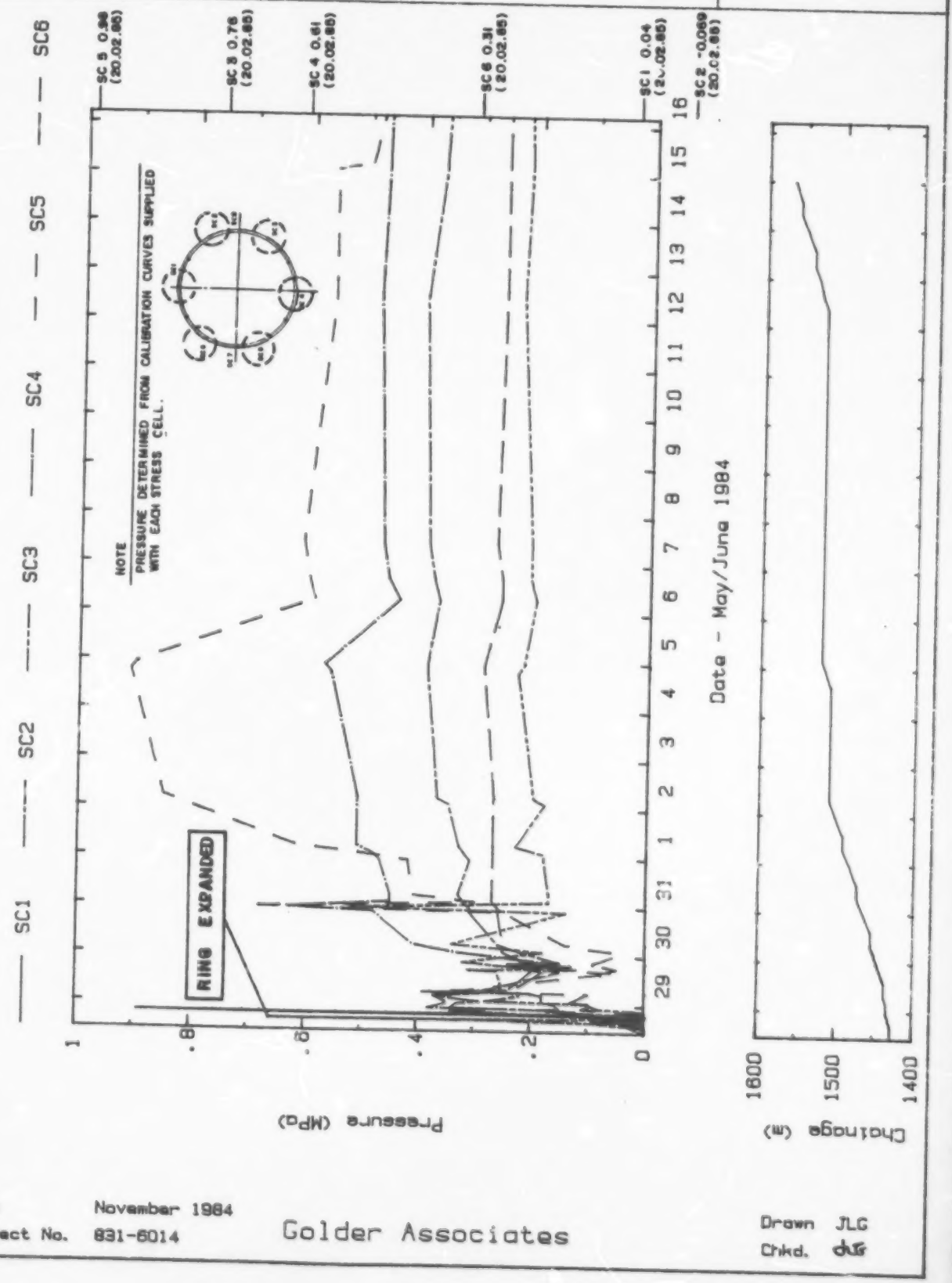
Golder Associates

Drawn JLG
Chkd. GHG

STEEL SET STRESS CELLS

Circumferential Cells - ch. 1423m

FIGURE C.152



Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dwg

STEEL SET STRESS CELLS
Axial Cells - ch. 1423m

FIGURE C.153

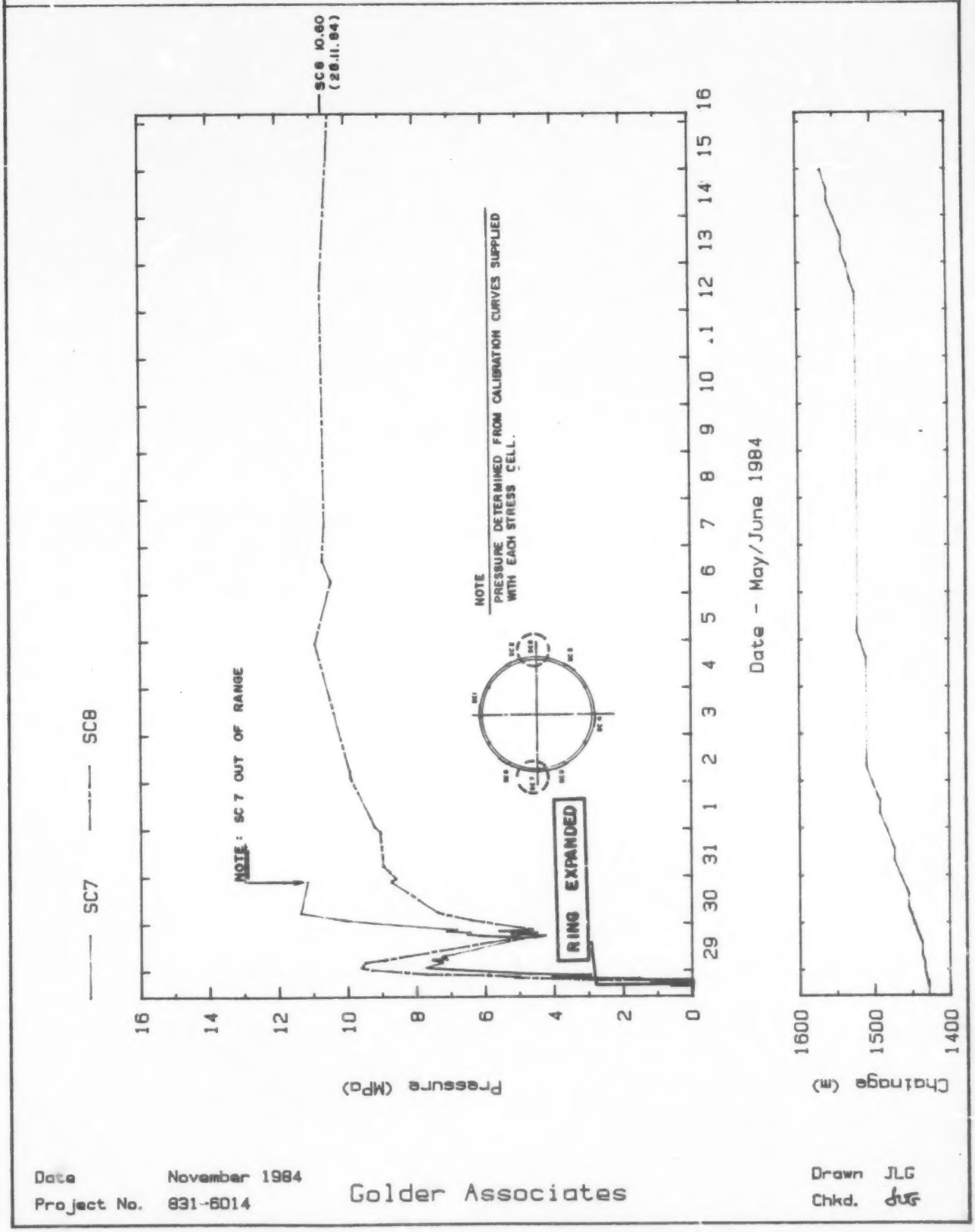
Date November 1984
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd.

STEEL SET STRESS CELLS
Axial Cells - ch. 1423m

FIGURE C.154



Date November 1984
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd.

STEEL SET STRESS CELLS

Circumferential Cells - ch. 1831m

FIGURE C.155

Date November 1984

Project No. 831-6014

Golder Associates

Drawn JLG

Chkd. dvg

STEEL SET STRESS CELLS

Circumferential Cells - ch. 1831m

FIGURE C.156

Date November 1984

Project No. 831-6014

Golder Associates

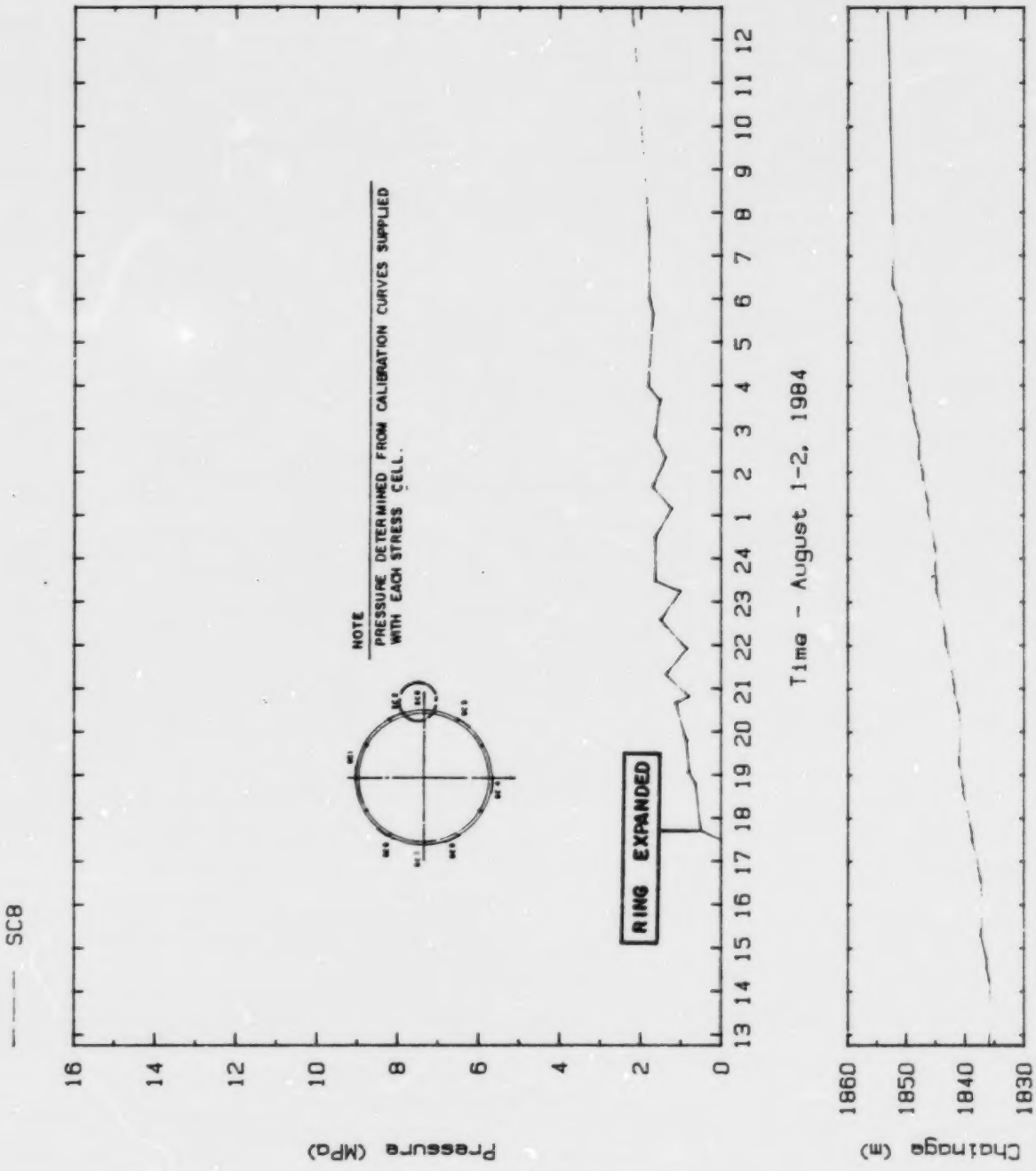
Drawn JLG

Chkd. JMF

STEEL SET STRESS CELLS

Axial Cells - ch. 1831m

FIGURE C.157


SC8
NOTE
PRESSURE DETERMINED FROM CALIBRATION CURVES SUPPLIED WITH EACH STRESS CELL.
RING EXPANDED
Time - August 1-2, 1984
Pressure (MPa)
Chainage (m)
16 14 12 10 8 6 4 2 0
13 14 15 16 17 18 19 20 21 22 23 24 1 2 3 4 5 6 7 8 9 10 11 12
1860 1850 1840 1830

Date November 1984

Project No. 831-6014

Golder Associates

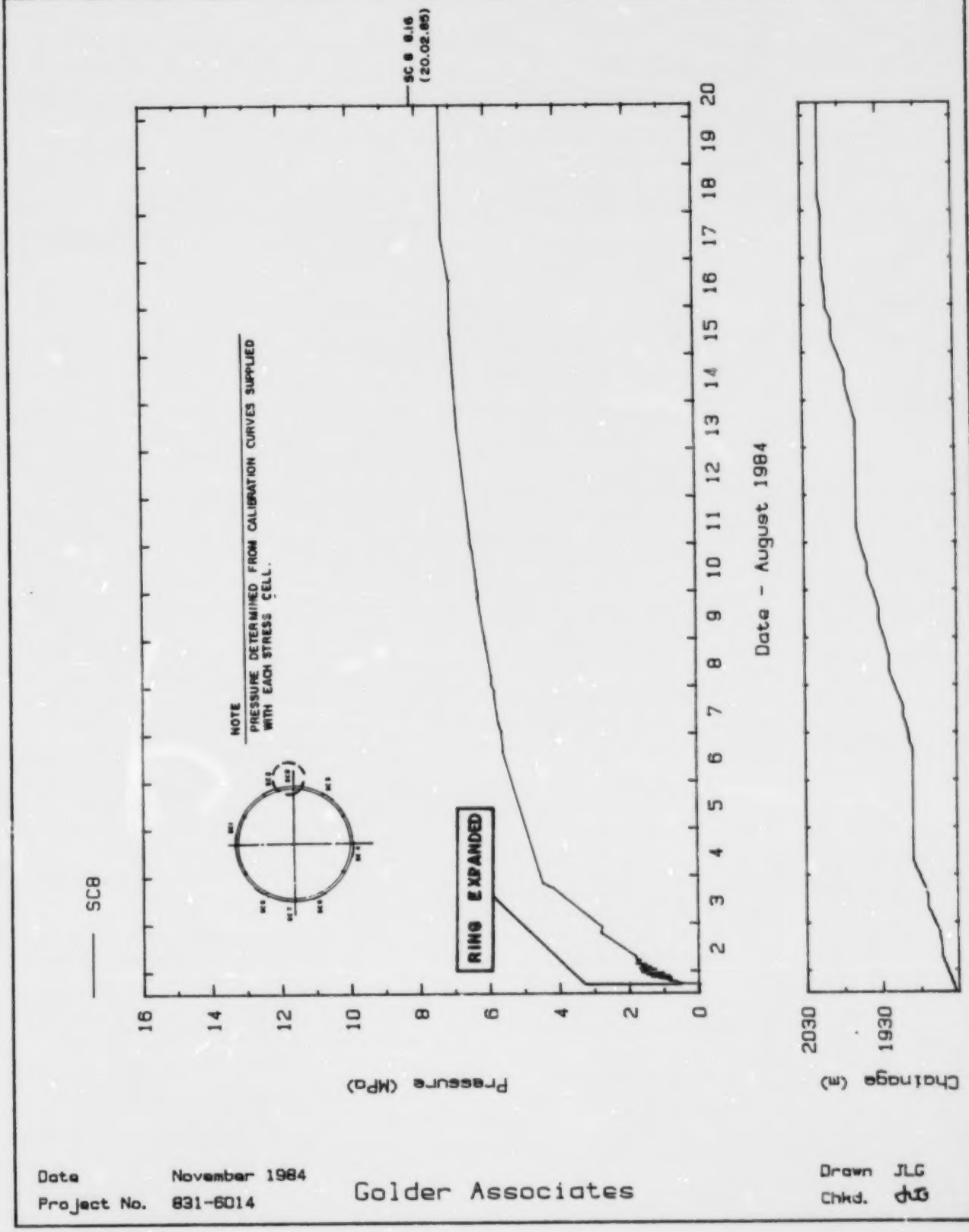
Drawn JLG

Chkd. GHG

STEEL SET STRESS CELLS

Axial Cells - ch. 1831m

FIGURE C.158



Date November 1984

Project No. 831-6014

Golder Associates

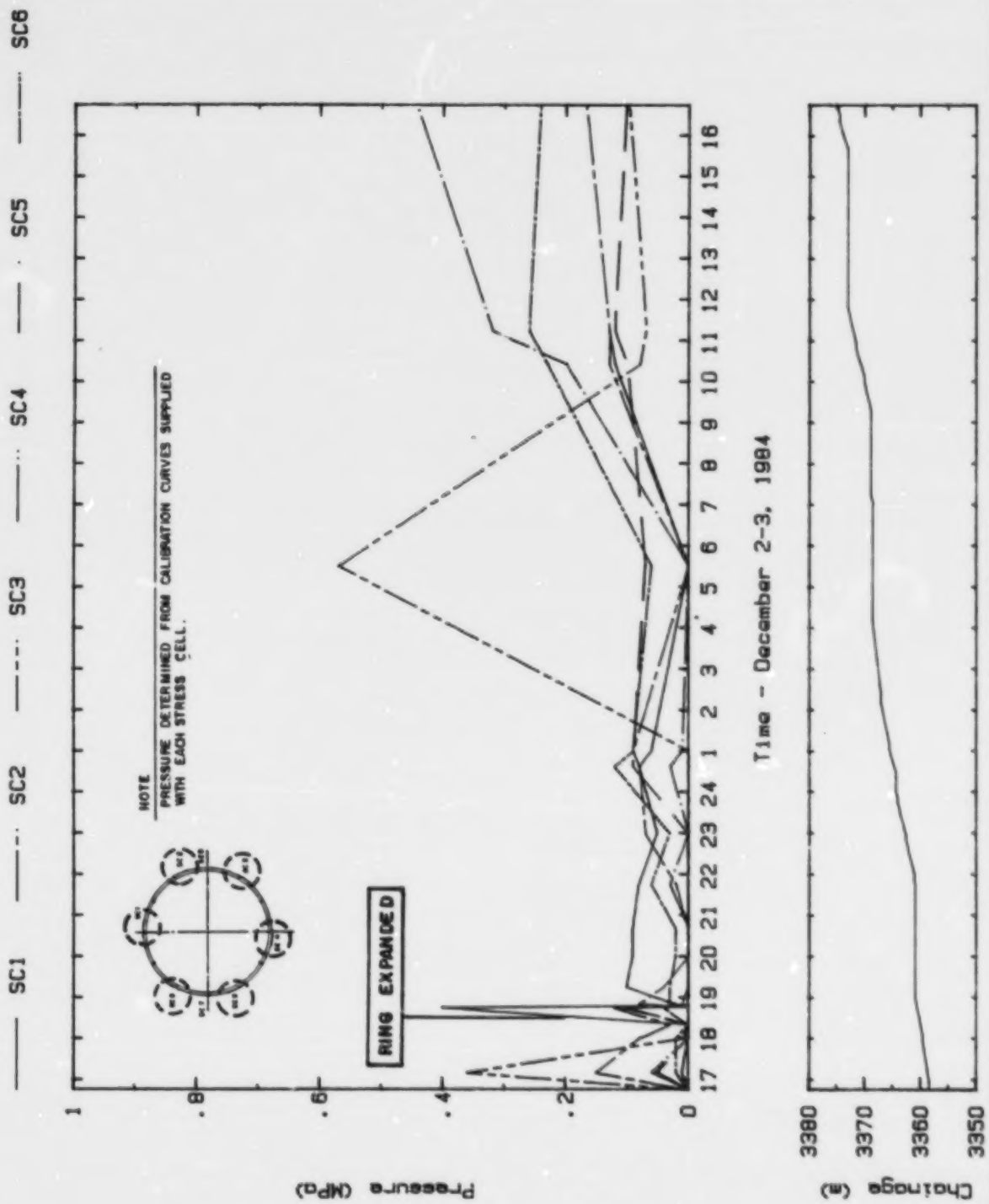
Drawn JLG

Chkd. dhs

STEEL SET STRESS CELLS

Circumferential Cells - ch. 3353m

FIGURE C.159



Date April 1985

Project No. 831-6014

Golder Associates

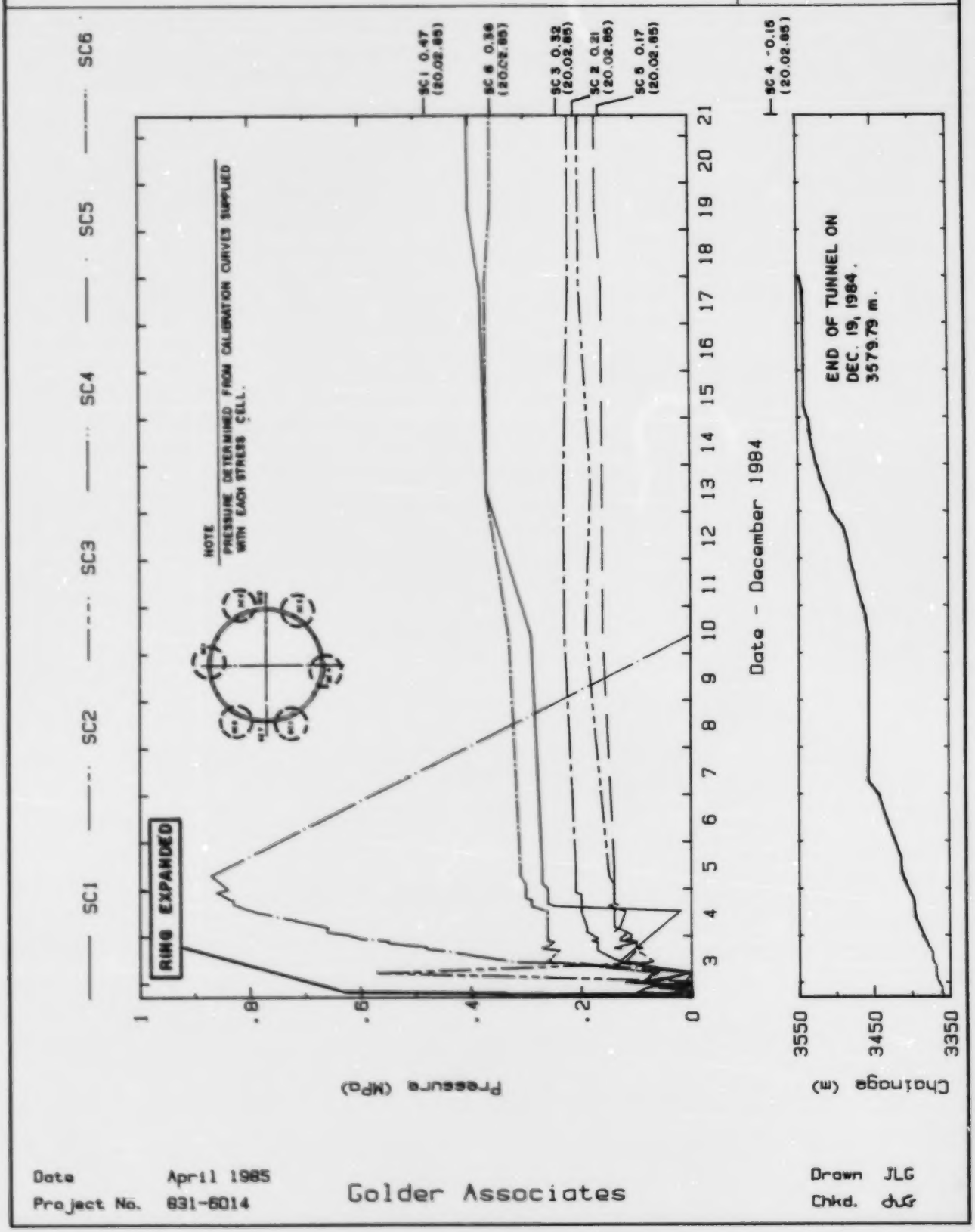
Drawn JLG

Chkd.

STEEL SET STRESS CELLS

Circumferential Cells - ch. 3353m

FIGURE C.160



Date April 1985

Project No. 831-6014

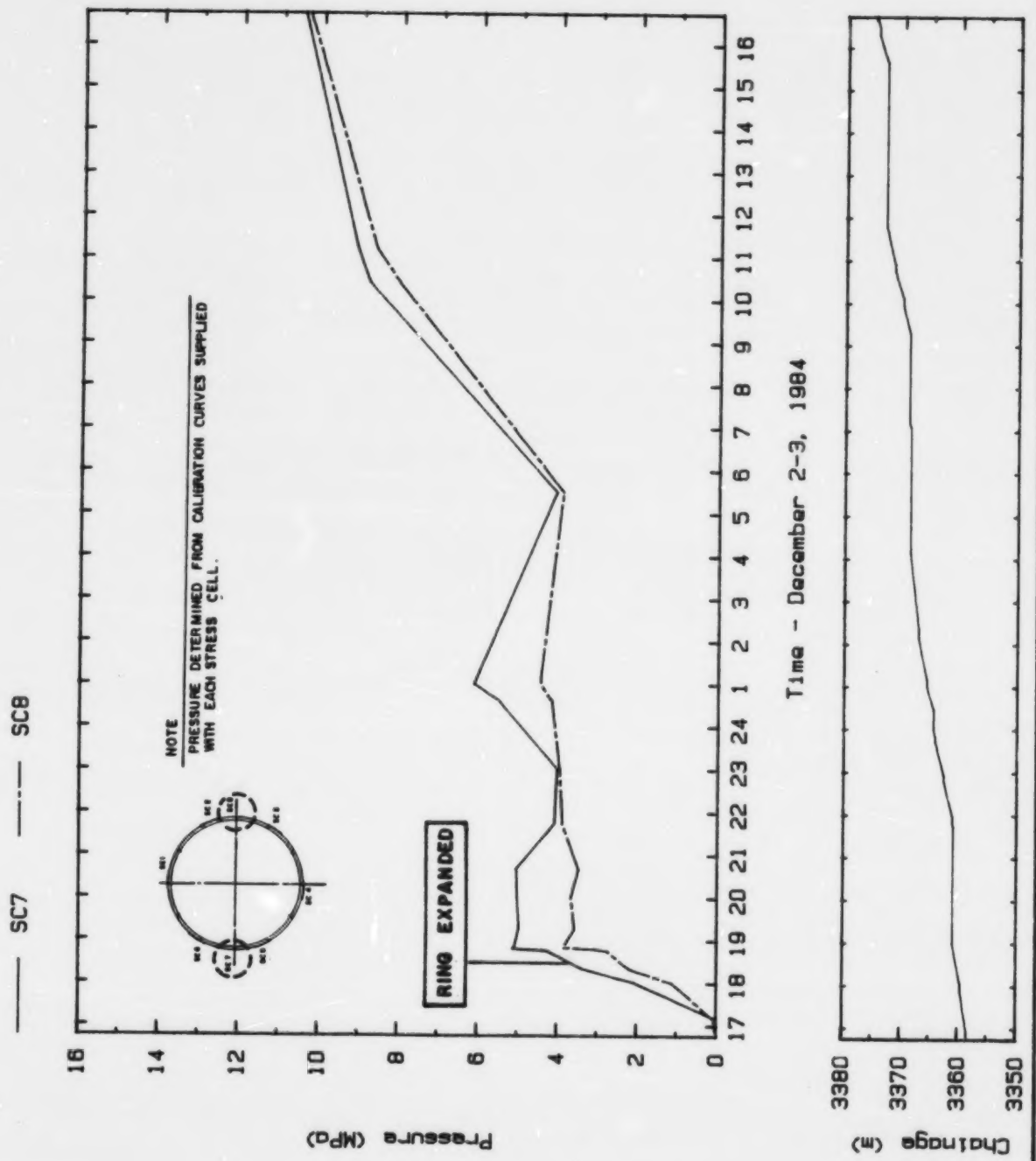
Golder Associates

Drawn JLG

Chkd. dwg

STEEL SET STRESS CELLS
Axial Cells - ch. 3353m

FIGURE C.161



Date April 1985
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd.

STEEL SET STRESS CELLS
Axial Cells - ch. 3353m

FIGURE C.162

Date April 1985
Project No. 831-6014

Golder Associates

Drawn JLG
Chkd. dhG

APPENDIX C-5

CONVERGENCE DATA

Reduction of Convergence Data

The convergence data tables are formatted similar to the extensometer data with the following designation:

2T920C (Rock)

where
- 2T - Tunnel No.
- 920 - Chainage along tunnel (m)
- C - Convergence array
- (Rock) - Convergence studs in rock or on ring beams

The line numbers are designated as follows

L 1-4 - Line 1-4

For each set of readings the date, time and chainage of the tunnel are shown as well as the raw data under headings Tape (m), Gauge (mm) and Temp (°C). The Dif. mm column is the reduced reading in mm.

a) For convergence arrays including calibration readings

$$\text{Dif. (mm)} = 10\ (R_{to} - R_{t1} + C_{t1} - C_{to}) + R_{g1} - R_{go} - C_{go} - C_{g1}$$

b) For convergence arrays with no calibration readings

$$\text{Dif. (mm)} = 10\ (R_{to} - R_{t1}) + R_{g1} - R_{go}$$

where
- 10 = conversion cm to mm
- R_{to} = datum measurement on tape (cm)
- R_{t1} = reading on tape (cm)
- C_{t1} = calibration reading on tape (cm)
- C_{to} = calibration datum measurement on tape (cm)
- R_{g1} = dial gauge reading (mm)
- R_{go} = datum dial gauge reading (mm)
- C_{go} = calibration datum dial gauge reading (mm)
- C_{g1} = calibration dial gauge reading (mm)

For all convergence readings, positive values indicate convergence.

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T152C — Chainage 152 m
Date installed 18/03/82 — Tunnel No. 3 — Sheet 1

	Tape	Gauge	Temp	Dif.mm	Tape	Gauge	Temp	Dif.mm	Tape	Gauge	Temp	Dif.mm	Tape	Gauge	Temp	Dif.mm
Date/Time	18.03				19.03				20.03				24.03			
Tunnel ch.																
L1-3	500	3.08	1.8	-	500	3.25	4.4	0.13					500	12.62	4	9.04
L1-4	685	25.80	1.8	-					685	28.86	3.9	2.64				
L1-5	705	26.86	1.8	-	705	28.55	4.4	1.65	705	29.61	3.9	2.33	705	39.67	4	2.33
L2-4	665	25.56	1.8	-												
L2-5	725	43.61	1.8	-					725	44.56	3.9	0.53	725	43.95	4	0.53
L3-5	495	3.87	1.8	-	495	4.54	4.4	0.63					495	4.74	4	0.63
L2-3	400	11.10	1.8	-	400	9.99	4.4	-1.15					400	12.15	4	0.55
L3-6																
Calibration	30	13.08	22.8		30	13.12	17.8		30	13.50	25.6		30	13.58	20	
Comments	Datum												Studs 4/5 replaced			

	Tape	Gauge	Temp	Dif.mm	Tape	Gauge	Temp	Dif.mm	Tape	Gauge	Temp	Dif.mm	Tape	Gauge	Temp	Dif.mm
Date/Time	25.03				31.03				2.04				5.04			
Tunnel ch.																
L1-3	500	13.08	5.6	9.47	500	13.19	4.4	9.63					500	14.47	5.6	10.91
L1-4					685	43.46	4.4	2.64	685	43.20	3.3	2.40	685	43.51	5.6	2.69
L1-5	705	42.24	5.6	4.87	705	39.43	4.4	2.11	705	39.58	3.3	2.28	705	38.30	5.6	0.98
L2-4	665	31.67	5.6	.00	665	31.32	4.4	-0.30	665	31.41	3.3	-0.19	665	27.47	5.6	-4.15
L2-5					725	42.74	4.4	-0.66	725	42.30	3.3	-1.08	725	38.20	5.6	-5.20
L3-5	495	5.06	5.6	0.92	500	48.24	4.4	-5.85					500	48.95	5.6	-5.14
L2-3	400	12.92	5.6	1.29												
L3-6																
Calibration	30	13.61	16.7		30	13.56	17.8		30	13.54	18.9		30	13.56	18.9	
Comments					Stud 4 replaced											

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T152C — Chainage 152 m
Date installed 18/03/82 — Tunnel No. 3 — Sheet 2

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	18.03		15.04		22.04		30.04	
Tunnel ch.								
L1-3	500 3.08 1.8	-						
L1-4	685 25.80 1.8	-	685 42.84 3.9	2.01	685 43.58 5.6	1.93		
L1-5	705 26.86 1.8	-	705 37.06 3.9	-0.27	705 38.11 5.6	-0.04	705 39.66 5.6	2.36
L2-4	665 25.56 1.8	-	665 30.25 3.9	-1.38	665 27.97 5.6	-4.48		
L2-5	725 43.61 1.8	-	725 37.03 3.9	-6.38	725 37.44 5.6	-6.79		
L3-5	495 3.87 1.8	-	500 49.95 3.9	-4.15	500 46.48 5.6	-8.44		
L2-3	400 11.10 1.8	-						
L3-6								
Calibration	30 13.08 22.8		30 13.57 23.9		30 14.39 18.3		30 13.54 20.6	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	3.05		14.05		14.05		10.06	
Tunnel ch.								
L1-3								
L1-4	685 43.02 6.1	2.24	685 43.00 6.1	2.31	685 43.00 6.1	2.31	685 42.86 7.8	2.04
L1-5	705 38.69 6.1	1.41	705 39.39 6.1	2.20	700 1.32 6.1	2.20	700 1.34 7.8	2.09
L2-4	665 28.00 6.1	-3.58	665 28.85 6.1	-2.64	665 31.39 6.1	-2.64		
L2-5	725 38.05 6.1	-5.31	725 37.76 6.1	-5.51	720 5.91 6.1	-5.51	720 5.91 7.8	-5.64
L3-5	500 49.71 6.1	-4.34						
L2-3								
L3-6								
Calibration	30 13.52 22.2		30 13.43 21.7		30 13.43 21.7		30 13.56 21.1	
					Studs 2 & 5 replaced			
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T152C
Date installed 18/03/82 Tunnel No. 3

Chainage 152 e
Sheet 3

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	18.03		9.07		30.07		13.10	
Tunnel ch.								
L1-3	500 3.08 1.8	-						
L1-4	685 25.80 1.8	-			1585 43.45 15.6	3.07	675 7.78 12	4.82
L1-5	705 26.86 1.8	-			1600 1.39 15.6	2.58	695 15.60 12	4.21
L2-4	665 25.56 1.8	-			1565 31.34 15.6	-2.38	660 46.10 12	-0.20
L2-5	725 43.61 1.8	-	820 1.28 21.1	-8.93	1620 2.39 15.6	-8.90	715 16.62 12	-7.25
L3-5	495 3.87 1.8	-						
L2-3	400 11.10 1.8	-						
L3-6	450 11.35 9	-						
Calibration	30 13.08 22.8		130 12.04 23.3		930 13.12 24.4		25 25.70 20.5	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	25.10		25.10		28.10		10.11	
Tunnel ch.								
L1-3								
L1-4			685 2.76 6	5.21				
L1-5	695 15.93 6	4.50					705 9.80 6	3.71
L2-4			670 40.25 8	-0.64				
L2-5	715 19.84 6	-4.07					725 12.85 6	-5.72
L3-5								
L2-3								
L3-6					450 11.35 9	-		
Calibration	25 25.74 14		35 20.29 18		35 20.39 16		35 20.40 24	
Comments								

Notes: +ve values convergence

Donkin-Morien D... ...ment Project
Rock Sup... ...teraction Study
...NVERGENCE DATA

Instrument Section Convergence Array 3T152C
Date installed 18/03/82 Tunnel No. 3 Chainage 152 m
Sheet 4

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	18.03		11.11		15.12		18.01	
Tunnel ch.								
L1-3	500 3.08 1.8	-						
L1-4	685 25.80 1.8	-	690 19.13 5	4.40	755 49.80 6	2.19	800 6.02 0	3.76
L1-5	705 26.86 1.8	-	710 26.90 5	3.74	770 9.47 6	3.43	820 14.14 0	3.45
L2-4	665 25.56 1.8	-	670 7.00 5	-1.07	735 39.71 6	-1.24		
L2-5	725 43.61 1.8	-	730 31.50 5	-4.14	790 14.18 6	-4.34	840 18.96 0	-4.21
L3-5	495 3.87 1.8	-						
L2-3	400 11.10 1.8	-						
L3-6	450 11.35 9	-	455 26.46 5	-1.97	515 9.02 6	-2.29	565 15.18 0	-0.78
Calibration	30 13.08 22.8		40 37.47 20		100 20.35 24.5		150 25.00 24	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	19.01		11.02		26.04		20.06	
Tunnel ch.								
L1-3								
L1-4			800 4.78 -2	2.75	675 9.36 7	4.03	675 10.89 17	6.31
L1-5			820 13.75 -2	3.29	695 17.00 7	3.24	695 18.21 17	5.20
L2-4	785 43.99 0	-1.48	785 43.25 -2	-2.12	660 46.90 7	-1.77	660 47.32 17	-0.60
L2-5			840 17.00 -2	-5.94	715 21.37 7	-4.87	715 22.65 17	-2.84
L3-5								
L2-3								
L3-6			565 15.09 -2	-0.64	440 18.55 7	-0.48	440 19.22 17	0.94
Calibration	150 24.87 20		150 24.77 24		25 28.07 20		25 27.32 20	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T152C — Chainage 152 m
Date installed 18/03/82 — Tunnel No. 3 — Sheet 5

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	18.03		15.08		22.11		17.01 1984	
Tunnel ch.								
L1-3	500 3.08 1.8	-						
L1-4	685 25.80 1.8	-	675 9.22 14	4.59	675 9.34 6	5.40	675 9.44 1	5.55
L1-5	705 26.86 1.8	-	695 17.68 14	4.62	695 16.68 6	4.31	695 16.36 1	4.04
L2-4	665 25.56 1.8	-	660 47.62 14	-0.35	660 47.37 6	0.09	660 46.64 1	-0.59
L2-5	725 43.61 1.8	-	715 22.00 14	-3.54	715 21.20 6	-3.65	715 22.75 1	-2.05
L3-5	495 3.87 1.8	-						
L2-3	400 11.10 1.8	-						
L3-6	450 11.35 9	-	440 18.98 14	0.65	440 18.21 6	0.57	440 18.14 1	0.55
Calibration	30 13.08 22.8		25 27.37 20		25 26.68 20		25 26.63 22	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time								
Tunnel ch.								
L1-3								
L1-4								
L1-5								
L2-4								
L2-5								
L3-5								
L2-3								
L3-6								
Calibration								
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T164C — Chainage 164 m
Date installed 25/03/82 — Tunnel No. 3 — Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	25.03		26.03		31.03		2.04	
Tunnel ch.								
L1-3	405 21.52 5.6	0.00	405 33.81 6.7	12.29	405 14.24 4.4	0.00		
L1-4	650 36.74 5.6	0.00	650 15.37 6.7	-21.37	650 16.25 4.4	0.93	650 18.18 3.3	2.88
L1-5	720 44.91 5.6	0.00	720 17.89 6.7	-27.02	720 20.81 4.4	2.97	720 23.05 3.3	5.23
L2-4	515 32.35 5.6	0.00			515 30.78 4.4	-1.52		
L2-5	640 5.93 5.6	0.00	640 6.32 6.7	0.39	640 8.26 4.4	2.38	640 8.20 3.3	2.34
L3-5	450 20.90 5.6	0.00	450 39.90 6.7	19.00	450 24.26 4.4	0.00		
L2-3	95 25.07 5.6	0.00						
Calibration	30 13.61 16.7		30 13.61 16.7		30 13.56 17.8		30 13.54 18.9	
Comments	Datum		Studs 1/3 damaged		Stud 3 replaced			

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	5.04		16.04		22.04		14.05	
Tunnel ch.								
L1-3	405 17.13 5.6	2.89						
L1-4	650 18.38 5.6	3.06	650 18.20 6.1	2.03	650 18.21 5.6	2.06		
L1-5	720 23.80 5.6	5.96	720 23.23 6.1	4.54	720 23.85 5.6	5.18	720 23.16 6.1	5.45
L2-4	515 28.98 5.6	-3.32						
L2-5	640 9.16 5.6	3.28						
L3-5	450 23.32 5.6	-0.94	450 22.04 6.1	-3.07	450 23.84 5.6	-1.25		
L2-3								
Calibration	30 13.56 18.9		30 14.41 20		30 14.39 18.3		30 13.43 21.7	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T164C — Chainage 164 m
Date installed 25/03/82 — Tunnel No. 3 — Sheet 2

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	25.03		14.05		10.06		9.07	
Tunnel ch.								
L1-3	405 21.52 5.6	0.00						
L1-4	650 36.74 5.6	0.00						
L1-5	720 44.91 5.6	0.00	715 5.12 6.1	5.45	715 4.93 7.8	5.13	815 4.58 21.1	6.30
L2-4	515 32.35 5.6	0.00						
L2-5	640 5.93 5.6	0.00						
L3-5	450 20.90 5.6	0.00						
L2-3	95 25.07 5.6	0.00						
Calibration	30 13.61 16.7		30 13.43 21.7		30 13.56 21.1		130 12.04 23.3	
	Datum		Stud 1 replaced					
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	30.07		14.10		28.10		11.11	
Tunnel ch.								
L1-3								
L1-4								
L1-5	1615 3.74 15.6	4.38	710 19.84 13	7.92	720 14.73 9	8.10	725 31.85 6	8.14
L2-4								
L2-5								
L3-5								
L2-3								
Calibration	930 13.12 24.4		25 25.68 24		35 20.39 16		40 37.47 20	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T164C
Date installed 25/03/82 Tunnel No. 3 Chainage 164 m
Sheet 3

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	25.03		18.01		11.02		15.02	
Tunnel ch.			1983					
L1-3	405 21.52 5.6	0.00						
L1-4	650 36.74 5.6	0.00						
L1-5	720 44.91 5.6	0.00	835 18.72 0	7.48	835 17.40 0	6.39	1045 13.82 5	7.28
L2-4	515 32.35 5.6	0.00						
L2-5	640 5.93 5.6	0.00						
L3-5	450 20.90 5.6	0.00						
L2-3	95 25.07 5.6	0.00						
Calibration	30 13.61 16.7		150 25.00 24		150 24.77 24		360 20.30 22	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	26.04		20.06		15.08		22.11	
Tunnel ch.								
L1-3								
L1-4								
L1-5	710 21.08 7	6.77	710 22.01 17	8.45	710 20.52 14	6.91	710 20.53 6	7.61
L2-4								
L2-5								
L3-5								
L2-3								
Calibration	25 28.07 20		25 27.32 20		25 27.37 20		25 26.68 20	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T164C
Date installed 25/03/82 Tunnel No. 3

Chainage 164 m
Sheet 4

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	25.03		17.01					
Tunnel ch.			1984					
L1-3	405 21.52 5.6	0.00						
L1-4	650 36.74 5.6	0.00						
L1-5	720 44.91 5.6	0.00	710 20.69 1	7.82				
L2-4	515 32.35 5.6	0.00						
L2-5	640 5.93 5.6	0.00						
L3-5	450 20.90 5.6	0.00						
L2-3	95 25.07 5.6	0.00						
Calibration	30 13.61 16.7		25 26.63 22					
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time								
Tunnel ch.								
L1-3								
L1-4								
L1-5								
L2-4								
L2-5								
L3-5								
L2-3								
Calibration								
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T200C — Chainage 200 m
Date installed 05/04/82 — Tunnel No. 3 — Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	5.04		12.04 am		13.04		14.04	
Tunnel ch.								
L1-3	560 25.32 5.6	0.00			560 25.34 5.6	-0.07	560 27.84 6.7	2.47
L1-4	670 33.98 5.6	0.00	670 33.33 5.6	-0.70	670 33.61 5.6	-0.46	670 33.05 6.7	-0.98
L1-5	715 19.94 5.6	0.00			715 14.45 5.6	.00	715 17.96 6.7	3.55
L2-4	510 31.05 5.6	0.00	510 31.52 5.6	0.42	510 31.49 5.6	0.35	510 36.38 6.7	5.28
L2-5	640 33.79 5.6	0.00			640 40.31 5.6	.00	640 44.31 6.7	4.04
L3-5	500 35.53 5.6	0.00			500 9.71 5.6	0.00	500 6.47 6.7	-3.20
Calibration	30 13.56 18.9		30 13.61 19.4		30 13.65 18.9		30 13.61 16.7	
Comments	Datum				Stud 5 damaged			

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	15.04		16.04		21.04		22.04	
Tunnel ch.								
L1-3	560 30.13 3.9	4.80	560 31.18 6.1	5.01	560 31.92 6.7	5.44	560 31.88 7.2	6.37
L1-4	670 40.67 3.9	6.68	670 40.84 6.1	6.01	670 42.48 6.7	7.34	670 41.16 7.2	6.99
L1-5	715 22.85 3.9	8.48	715 23.74 6.1	8.53	715 26.07 6.7	10.55	715 23.28 7.2	8.73
L2-4	510 38.69 3.9	7.63	510 39.81 6.1	7.91	510 42.31 6.7	10.10	510 41.16 7.2	9.92
L2-5	640 46.98 3.9	6.75	640 48.17 6.1	7.10	640 49.92 6.7	8.54	640 49.53 7.2	9.12
L3-5	500 6.86 3.9	-2.77	500 8.33 6.1	-2.14	500 9.96 6.7	-0.82	500 7.71 7.2	-2.10
Calibration	30 13.57 23.9		30 14.41 20		30 14.72 19.4		30 13.75 20.6	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T200C — Chainage 200 m
Date installed 05/04/82 — Tunnel No. 3 — Sheet 2

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	5.04		30.04		3.05		14.05	
Tunnel ch.								
L1-3	560 25.32 5.6	0.00			560 32.03 6.1	6.75		
L1-4	670 33.98 5.6	0.00			670 43.21 6.1	9.27	670 42.99 6.1	9.14
L1-5	715 19.94 5.6	0.00	715 14.49 5.6	8.73	715 14.47 6.1	8.73	715 14.35 6.1	8.70
L2-4	510 31.05 5.6	0.00						
L2-5	640 33.79 5.6	0.00						
L3-5	500 35.53 5.6	0.00			500 36.34 6.1	-2.10		
Calibration	30 13.56 18.9		30 13.54 20.6		30 13.52 22.2		30 13.43 21.7	
Comments	Datum		Stud 5 replaced					

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	10.06		9.07		30.07		14.10	
Tunnel ch.								
L1-3								
L1-4					1570 42.71 15.6	9.17	660 7.97 13.5	11.87
L1-5	715 14.90 7.8	9.12	815 13.90 21.1	9.64	1615 13.99 15.6	8.65	710 29.57 13.5	11.67
L2-4								
L2-5								
L3-5								
Calibration	30 13.56 21.1		130 12.04 23.3		930 13.12 24.4		25 25.68 24	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T200C — Chainage 200 m
Date installed 05/04/82 — Tunnel No. 3 — Sheet 3

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	5.04		28.10		11.11		15.12	
Tunnel ch.								
L1-3	560 25.32 5.6	0.00						
L1-4	670 33.98 5.6	0.00	670 2.35 7	11.54	675 19.28 6	11.39	740 49.98 6	9.21
L1-5	715 19.94 5.6	0.00	720 24.24 7	11.63	725 41.05 6	11.36	785 23.13 6	10.56
L2-4	510 31.05 5.6	0.00						
L2-5	640 33.79 5.6	0.00						
L3-5	500 35.53 5.6	0.00						
Calibration	30 13.56 18.9		35 20.39 16		40 37.47 20		100 20.35 24.5	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	18.01		11.02		26.04		20.06	
Tunnel ch.	1983							
L1-3								
L1-4	785 6.11 2	10.69	785 4.30 -2	9.11	660 9.83 7	11.34	660 10.97 17	13.23
L1-5	835 27.76 2	10.54	835 27.01 -2	10.02	710 30.34 7	10.05	710 31.83 17	12.29
L2-4								
L2-5								
L3-5								
Calibration	150 25.00 24		150 24.77 24		25 28.07 20		25 27.32 20	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T200C — Chainage 200 m
Date installed 05/04/82 — Tunnel No. 3 — Sheet 4

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	5.04		15.08		22.11		17.01	
Tunnel ch.							1984	
L1-3	560 25.32 5.6	0.00						
L1-4	670 33.98 5.6	0.00	660 10.00 14	12.21	660 9.53 6	12.43	660 8.56 2	11.51
L1-5	715 19.94 5.6	0.00	710 30.08 14	10.49	710 30.19 6	11.29	710 30.17 2	11.32
L2-4	510 31.05 5.6	0.00						
L2-5	640 33.79 5.6	0.00						
L3-5	500 35.53 5.6	0.00						
Calibration	30 13.56 18.9		25 27.37 20		25 26.68 20		25 26.63 22	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time								
Tunnel ch.								
L1-3								
L1-4								
L1-5								
L2-4								
L2-5								
L3-5								
Calibration								
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T460C
Date installed 02/07/82 Tunnel No. 3

Chainage 460 m
Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	2.07		5.07		6.07		13.07	
Tunnel ch.								
L1-3	465 49.75 15.6	0.00	465 49.88 15.6	0.12	460 1.12 13.3	1.21	560 10.02 17.8	11.73
L1-4	665 7.24 15.6	0.00	665 9.04 15.6	1.79	665 9.75 13.3	2.35	765 14.84 17.8	9.06
L1-5	695 9.52 15.6	0.00	695 12.04 15.6	2.51	695 12.83 13.3	3.15	795 16.45 17.8	8.39
L2-4	600 4.24 15.6	0.00	600 6.15 15.6	1.90	600 6.54 13.3	2.14	700 7.62 17.8	4.84
L2-5	675 46.00 15.6	0.00	675 48.14 15.6	2.13	675 48.75 13.3	2.59	770 0.55 17.8	6.01
L3-5	490 6.07 15.6	0.00	490 5.85 15.6	-0.23	490 5.55 13.3	-0.68	590 6.20 17.8	1.59
L3-6	455 40.16 4							
Calibration	30 13.51 17.8		30 13.52 19.4		30 13.67 20.6		130 12.05 23.9	
Comments	Datum L3-6 26/10/82							

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	26.10		15.11		15.12		18.01	
Tunnel ch.							1983	
L1-3								
L1-4	670 25.15 4	11.16	675 42.33 8	11.20	735 26.18 6	12.10		
L1-5	700 28.41 4	12.14	705 45.28 8	11.87	765 28.21 6	11.85	815 32.33 4	11.32
L2-4	605 29.24 4	18.25	610 47.13 8	19.00	670 31.30 6	20.22		
L2-5	675 21.80 4	19.05	680 40.70 8	20.81	740 22.85 6	20.01		
L3-5								
L3-6	455 40.16 4	.00	455 6.72 8	-0.58	520 38.86 6	-1.39		
Calibration	35 20.26 14		40 37.40 24		100 20.35 24.5		150 25.00 24	
Comments	After studs removed from shotcrete							

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T460C — Chainage 460 m
Date installed 02/07/82 — Tunnel No. 3 — Sheet 2

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	2.07		19.01		19.01		11.02	
Tunnel ch.								
L1-3	465 49.75 15.6	0.00						
L1-4	665 7.24 15.6	0.00			785 35.74 8	17.14	785 38.41 2	19.91
L1-5	695 9.52 15.6	0.00					815 32.17 2	11.39
L2-4	600 4.24 15.6	0.00	720 43.10 8	27.50	720 47.94 8	27.50		
L2-5	675 46.00 15.6	0.00	790 28.20 8	20.84	790 31.97 8	20.84	790 29.50 2	18.47
L3-5	490 6.07 15.6	0.00						
L3-6	455 40.16 4		570 43.77 8	-1.00				
Calibration	30 13.51 17.8		150 24.87 20		150 24.87 20		150 24.77 24	
	Datum				Permanent studs			
	L3-6 26/10/82				installed			
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	26.04		20.06		15.08		22.11	
Tunnel ch.								
L1-3								
L1-4	660 41.74 7	19.94	660 41.60 12	20.55	660 42.32 16	21.22		
L1-5	690 35.12 7	11.04	690 35.12 12	11.79	690 36.05 16	12.67		
L2-4	595 50.12 7	26.48	590 0.90 12	28.01	590 0.27 16	27.33	590 0.65 7	28.40
L2-5	665 34.82 7	20.49	665 34.90 12	21.32	665 34.56 16	20.93	665 34.67 7	21.73
L3-5								
L3-6								
Calibration	25 28.07 20		25 27.32 20		25 27.37 20		25 26.68 20	
							Stud 1	
							damaged	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T460C — Chainage 460 m
Date installed 02/07/82 — Tunnel No. 3 — Sheet 3

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	2.07		17.01					
Tunnel ch.			1984					
L1-3	465 49.75 15.6	0.00						
L1-4	665 7.24 15.6	0.00						
L1-5	695 9.52 15.6	0.00						
L2-4	600 4.24 15.6	0.00	595 49.95 4	27.75				
L2-5	675 46.00 15.6	0.00	665 34.52 4	21.63				
L3-5	490 6.07 15.6	0.00						
L3-6	455 40.16 4							
Calibration	30 13.51 17.8		25 26.63 22					
	Datum							
	L3-6 26/10/82							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time								
Tunnel ch.								
L1-3								
L1-4								
L1-5								
L2-4								
L2-5								
L3-5								
L3-6								
Calibration								
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T714/719/726C — Chainage 720 m
Date installed 28/10/82 — Tunnel No. 3 — Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	28.10		29.10		1.11		2.11	
Tunnel ch.								
3T714C 3-6	315 16.62 8	0.00	315 16.35 8	-0.23	315 16.51 9	-0.16	315 16.50 10	-0.26
3T719C 3-6	395 16.27 8	0.00	395 15.91 8	-0.32	395 15.74 9	-0.58	395 15.94 10	-0.47
3T726C 3-6								
Calibration	35 20.21 17		35 20.17 18		35 20.26 17		35 20.35 19	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	9.11		11.11		19.11		23.11	
Tunnel ch.								
3T714C 3-6	315 16.25 13	-0.33			380 13.55 13	-3.30	380 16.04 13	-0.77
3T719C 3-6	395 15.61 13	-0.62	400 32.53 12	-1.00	460 12.81 13	-3.69	460 15.07 13	-1.39
3T726C 3-6								
Calibration	35 20.17 18		40 37.47 20		100 20.44 20.5		100 20.40 23	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T714/719/726C
Date installed 28/10/82 Tunnel No. 3

Chainage 720 m
Sheet 2

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	28.10		24.11		30.11		15.12	
Tunnel ch.								
3T714C 3-6	315 16.62 8	0.00	380 16.59 15	-0.36			380 15.85 6	-0.91
3T719C 3-6	395 16.27 8	0.00	460 15.22 15	-1.38			460 14.35 6	-2.06
3T726C 3-6	515 46.37 11				515 46.37 11	.00		
Calibration	35 20.21 17		100 20.54 22		100 20.19 24.5		100 20.35 24.5	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	16.12		12.01		18.01		11.02	
Tunnel ch.			1983					
3T714C 3-6			430 20.31 10	-1.11	430 20.49 8	-0.92	430 19.20 7	4.08
3T719C 3-6			510 19.27 10	-1.80			510 18.71 7	3.94
3T726C 3-6	515 45.78 10	-0.75			560 0.58 8	-0.60		
Calibration	100 20.35 24.5		150 25.01 20		150 25.00 24		150 18.71 24	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T714/719/726C — Chainage 720 m
Date installed 28/10/82 — Tunnel No. 3 — Sheet 3

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	28.10		14.02		26.04		20.06	
Tunnel ch.								
3T714C 3-6	315 16.62 8	0.00			305 22.11 7	-2.37	305 21.97 12	-1.76
3T719C 3-6	395 16.27 8	0.00			385 20.83 7	-3.30	385 20.71 12	-2.67
3T726C 3-6	515 46.37 11		775 44.28 10	-2.32	435 2.37 7	-1.88	435 3.18 12	-0.32
Calibration	35 20.21 17		360 20.42 25		25 28.07 20		25 27.32 20	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	17.08		22.11		17.01			
Tunnel ch.					1984			
3T714C 3-6	305 22.62 16	-1.69	305 22.23 9	-0.86	305 22.05 7	-0.99		
3T719C 3-6	385 21.96 16	-2.00	385 20.50 9	-2.24	385 19.90 7	-2.79		
3T726C 3-6	435 3.55 16	-0.53	435 2.84 9	-0.02	435 1.95 7	-0.86		
Calibration	25 27.90 23		25 26.68 20		25 26.63 22			
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T798C — Chainage 798 m
Date installed 15/11/82 — Tunnel No. 3 — Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	15/16.11		15.11		16.11		16.11	
Tunnel ch.								
L1-3	570 15.63 13	0.00					570 15.63 13	0.00
L1-4	720 5.22 13	0.00					720 5.22 13	0.00
L1-5	745 6.17 13	0.00					745 6.17 13	0.00
L2-4	530 25.77 12	0.00	530 25.77 12	0.00	590 13.83 16	5.04	590 19.29 13	10.50
L2-5	695 19.31 13	0.00					695 19.31 13	0.00
L3-5	510 36.18 16	0.00			510 36.18 16	0.00	510 40.56 13	4.38
Calibration	100 20.42 20		40 37.40 20		100 20.42 20		100 20.42 20	
Calib L2-4	40 37.40 20							
	Datum						L2-4 reading error?	
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	17.11		18.11		22.11		23.11	
Tunnel ch.								
L1-3					570 15.44 13.5	-0.17	570 15.55 17	-0.06
L1-4	720 5.84 10.5	0.64			720 6.80 13.5	1.60	720 5.20 17	.00
L1-5	745 7.10 10.5	0.95	745 8.59 13	2.48	745 8.90 13.5	2.75	745 8.80 17	2.65
L2-4	590 11.30 10.5	2.53			590 12.25 13.5	3.48	590 12.00 17	3.23
L2-5	695 19.72 10.5	0.43			695 19.70 13.5	0.41		
L3-5					510 43.10 13.5	6.94	510 42.40 17	6.24
Calibration	100 20.40 24		100 20.36 22		100 20.40 23		100 20.40 23	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T798C — Chainage 798 m
Date installed 15/11/82 — Tunnel No. 3 — Sheet 2

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	15/16.11		1.12		1.12		15.12	
Tunnel ch.								
L1-3	570 15.63 13	0.00						
L1-4	720 5.22 13	0.00	720 6.67 12	1.68	720 6.11 12	1.68	720 8.35 6	3.76
L1-5	745 6.17 13	0.00					745 6.91 6	0.81
L2-4	530 25.77 12	0.00						
L2-5	695 19.31 13	0.00					695 30.21 6	0.41
L3-5	510 36.18 16	0.00						
Calibration	100 20.42 20		100 20.19 24		100 20.19 24		100 20.35 24.5	
Calib L2-4	40 37.40 20							
Comments	Datum		Before new stud 4 installed		After new stud 4 installed		New stud 5	

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	21.01		9.02		14.02		26.04	
Tunnel ch.	1983							
L1-3								
L1-4	770 12.75 7	3.55			980 5.05 13	0.39	645 16.48 7	4.17
L1-5	795 14.50 7	3.79	795 12.98 10	2.34	1005 8.12 13	1.95	670 16.96 7	3.14
L2-4								
L2-5	745 35.98 7	1.57			955 28.58 13	-1.29	620 36.94 7	-0.58
L3-5								
Calibration	150 24.96 21		150 24.89 24		360 20.42 25		25 28.07 20	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T798C — Chainage 798 m
Date installed 15/11/82 — Tunnel No. 3 — Sheet 3

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	15/16.11		22.06		17.08		22.11	
Tunnel ch.								
L1-3	570 15.63 13	0.00						
L1-4	720 5.22 13	0.00	645 16.84 13	5.28	645 17.36 16	5.22	645 16.84 10	5.92
L1-5	745 6.17 13	0.00	670 15.81 13	2.74	670 17.21 16	3.56	670 15.03 10	2.60
L2-4	530 25.77 12	0.00						
L2-5	695 19.31 13	0.00	620 38.17 13	1.40	620 38.07 16	0.72	620 37.60 10	1.47
L3-5	510 36.18 16	0.00						
Calibration	100 20.42 20		25 27.32 20		25 27.90 23		25 26.68 20	
Calib L2-4	40 37.40 20							
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	17.01							
Tunnel ch.	1984							
L1-3								
L1-4	645 17.23 7	6.36						
L1-5	670 14.99 7	2.61						
L2-4								
L2-5	620 38.38 7	2.30						
L3-5								
Calibration	25 26.63 22							
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T918C — Chainage 918 m
Date installed 21/12/82 — Tunnel No. 3 — Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	21.12		3.01		4.01		5.01	
Tunnel ch.			1983					
L1-3	580 44.10 10	0.00	580 44.88 12	0.93	580 50.22 12	6.10	580 46.81 4	2.61
L1-4	780 46.50 10	0.00	780 48.80 12	2.45	780 47.39 12	0.87	780 49.76 4	3.16
L1-5	840 20.89 10	0.00	840 23.58 12	2.84	840 26.61 12	5.70	840 29.20 4	8.21
L2-4	630 11.26 10	0.00	630 14.01 12	2.90	630 17.28 12	6.00	630 18.61 4	7.25
L2-5	745 31.90 10	0.00	745 34.62 12	2.87	745 37.97 12	6.05	745 38.22 4	6.22
L3-5	570 41.25 10	0.00	570 43.12 12	2.02	570 43.58 12	2.31	570 42.57 4	1.22
L3-6								
Calibration	150 25.14 18		150 24.99 16		150 25.16 18		150 25.24 18	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	5.01		6.01		13.01		18.01	
Tunnel ch.								
L1-3	580 47.04 10	2.38			580 47.83 15	3.80		
L1-4	775 0.66 10	3.60						
L1-5	840 29.61 10	8.16	840 30.94 10	10.19	840 33.42 15	12.60	840 33.58 12	12.83
L2-4	630 19.46 10	7.64						
L2-5	745 40.13 10	7.67						
L3-5	570 44.40 10	2.59			570 45.53 15	4.35		
L3-6								
Calibration	150 25.70 20		150 25.00 18		150 25.07 23		150 25.00 24	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T918C — Chainage 918 m
Date installed 21/12/82 — Tunnel No. 3 — Sheet 2

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	21.12		20.01		8.02		9.02	
Tunnel ch.								
L1-3	580 44.10 10	0.00	580 48.74 10	4.91				
L1-4	780 46.50 10	0.00						
L1-5	840 20.89 10	0.00	840 34.25 10	13.63			840 34.21 15	13.57
L2-4	630 11.26 10	0.00						
L2-5	745 31.90 10	0.00	745 42.41 10	10.78				
L3-5	570 41.25 10	0.00	570 44.95 10	3.97				
L3-6	590 26.03 10	0.00			590 26.03 10	0.00		
Calibration	150 25.14 18		150 24.87 20		150 24.89 22		150 24.89 24	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	10.02		15.02		3.03		26.04	
Tunnel ch.								
L1-3	580 48.72 12	4.88						
L1-4					650 6.14 17	6.52	650 6.78 8	7.35
L1-5			1050 29.93 15	13.88	715 37.53 17	13.52	715 37.84 8	14.02
L2-4								
L2-5					620 45.19 17	10.17	620 45.48 8	10.65
L3-5	570 44.19 12	3.20						
L3-6					465 30.96 17	1.56	465 34.90 8	5.69
Calibration	150 24.88 21		360 20.30 22		25 28.26 20		25 28.07 20	
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 3T918C — Chainage 918 m
Date installed 21/12/82 — Tunnel No. 3 — Sheet 3

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	21.12		22.06		17.08		22.11	
Tunnel ch.								
L1-3	580 44.10 10	0.00						
L1-4	780 46.50 10	0.00	650 7.13 13	8.45			650 7.41 10	9.37
L1-5	840 20.89 10	0.00	715 36.92 13	13.85	715 39.38 16	15.73	715 38.02 10	15.59
L2-4	630 11.26 10	0.00						
L2-5	745 31.90 10	0.00	620 46.27 13	12.19			620 46.21 10	12.77
L3-5	570 41.25 10	0.00						
L3-6	590 26.03 10		465 36.67 13	8.21			465 39.82 10	12.00
Calibration	150 25.14 18		25 27.32 20		25 27.90 23		25 26.68 20	
	Datum							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	17.01							
Tunnel ch.	1984							
L1-3								
L1-4	650 7.12 7	9.13						
L1-5	715 38.25 7	15.87						
L2-4								
L2-5	620 46.47 7	13.08						
L3-5								
L3-6	465 42.36 7	14.59						
Calibration	25 26.63 22							
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 2T920C (Rock), 2T984C (Steel)
Date installed 02/04/84,10/04/84 Tunnel No. 2

Chainage 920/984 m
Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	2.04 20.00		10.04		4.05		7.06 9.00	
Tunnel ch.	925.08		1005.20		1254.70		1522.35	
L1-4 Rock	630 17.84	0.00			630 22.84	5.00	630 18.32 11	0.48
L2-3 Rock	630 24.02	0.00			670 25.79	1.77	670 24.20 11	0.18
L1-4 Steel			610 46.92	0.00	610 48.22	1.30	610 49.26 11	2.34
L2-3 Steel			660 44.41	0.00	660 45.00	0.59	660 45.21 11	0.80
Calibration	25		25		25		25	
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	27.11							
Tunnel ch.	3269.60							
L1-4 Rock	1295 18.71 12	0.87						
L2-3 Rock	1335 23.63 12	-0.37						
L1-4 Steel	1275 45.92 12	-1.00						
L2-3 Steel	1325 41.88 12	-2.53						
Calibration								
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 2T1428C (Rock & Steel) — Chainage 1428 m
Date installed 28/05/84 — Tunnel No. 2 — Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	28.05 10.40		29.05 6.00		4.06 15.10		7.06 10.00	
Tunnel ch.	1427.97		1437.20		1510.35		1522.35	
L1-4 Rock					660 20.13 17	0.00	660 20.34 14	0.21
L2-3 Rock							685 15.50 14	0.00
L1-4 Steel	640 19.49 14	0.00	640 22.83	3.34			640 39.18 14	19.69
L2-3 Steel			655 43.12	0.00	655 46.62 17	3.50	655 48.57 14	5.45
Calibration	25		25		25		25	
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	27.11							
Tunnel ch.	3269.60							
L1-4 Rock	1325 26.61 12	6.48						
L2-3 Rock	1350 21.54 12	6.04						
L1-4 Steel	1305 40.89 12	21.40						
L2-3 Steel	1315 5.51 12	12.39						
Calibration	690 19.98 20							
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 2T1910C (Rock & Steel)
Date installed 27/08/84 Tunnel No. 2

Chainage 1910 m
Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	27.08		27.11					
Tunnel ch.	2083.88		3269.60					
L1-4 Rock	Damaged							
L2-3 Rock	1350 9.37 20	0.00	Damaged					
L1-4 Steel	1305 7.12 20	0.00	1305 9.29 12	2.17				
L2-3 Steel	1320 33.61 20	0.00	1320 36.06 12	2.45				
Calibration	690 19.98		690					
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time								
Tunnel ch.								
L1-4 Rock								
L2-3 Rock								
L1-4 Steel								
L2-3 Steel								
Calibration								
Comments								

Notes: +ve values convergence

Donkin-Morien Development Project
Rock Support Interaction Study
CONVERGENCE DATA

Instrument Section Convergence Array 2T3353C Steel — Chainage 3353 m
Date installed 03/12/84 — Tunnel No. 2 — Sheet 1

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time	3.12							
Tunnel ch.	3370.00							
L1-4 Steel	1280 29.58 14	0.00						
L2-3 Steel	1310 48.77 12	0.00						
Calibration	690 19.98 14							
Comments								

	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm	Tape Gauge Temp	Dif.mm
Date/Time								
Tunnel ch.								
L1-4 Steel								
L2-3 Steel								
Calibration								
Comments								

Notes: +ve values convergence

APPENDIX D

INSITU MODULUS PLOTS

The test No. for in situ modulus determination is typically designated as:

T3 - SH - 1.0 m or T2-LH-1.0m

where; T2, T3 - Testing from Tunnel No. 2 or Tunnel No. 3

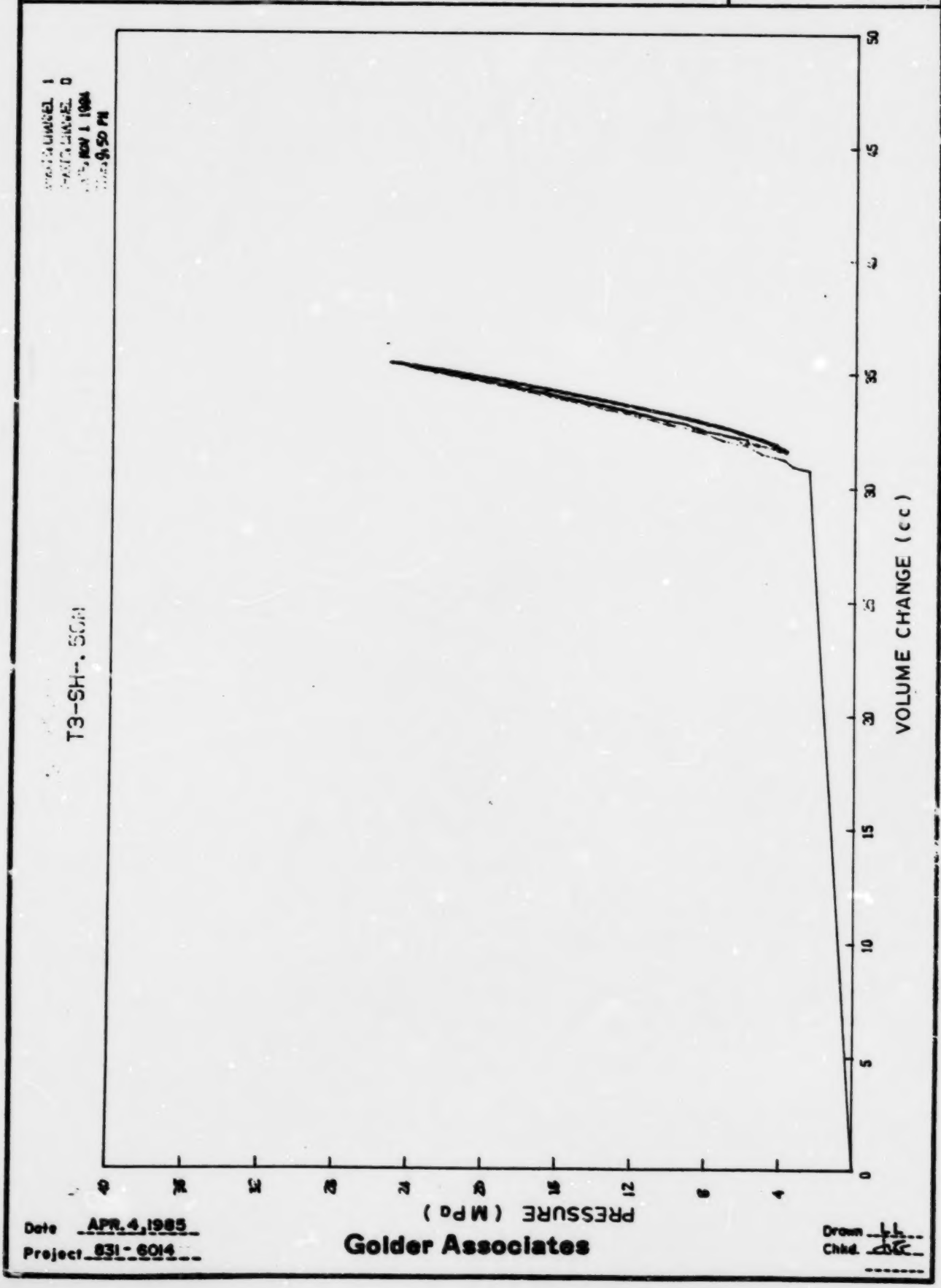
SH - Short Hole (hole at ch. 803 m)

LH - Long Hole (hole at ch. 805 m)

1.0m - 1.0 from tunnel wall (either Tunnel No. 2 or No. 3)

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-.50M

FIGURE D.1



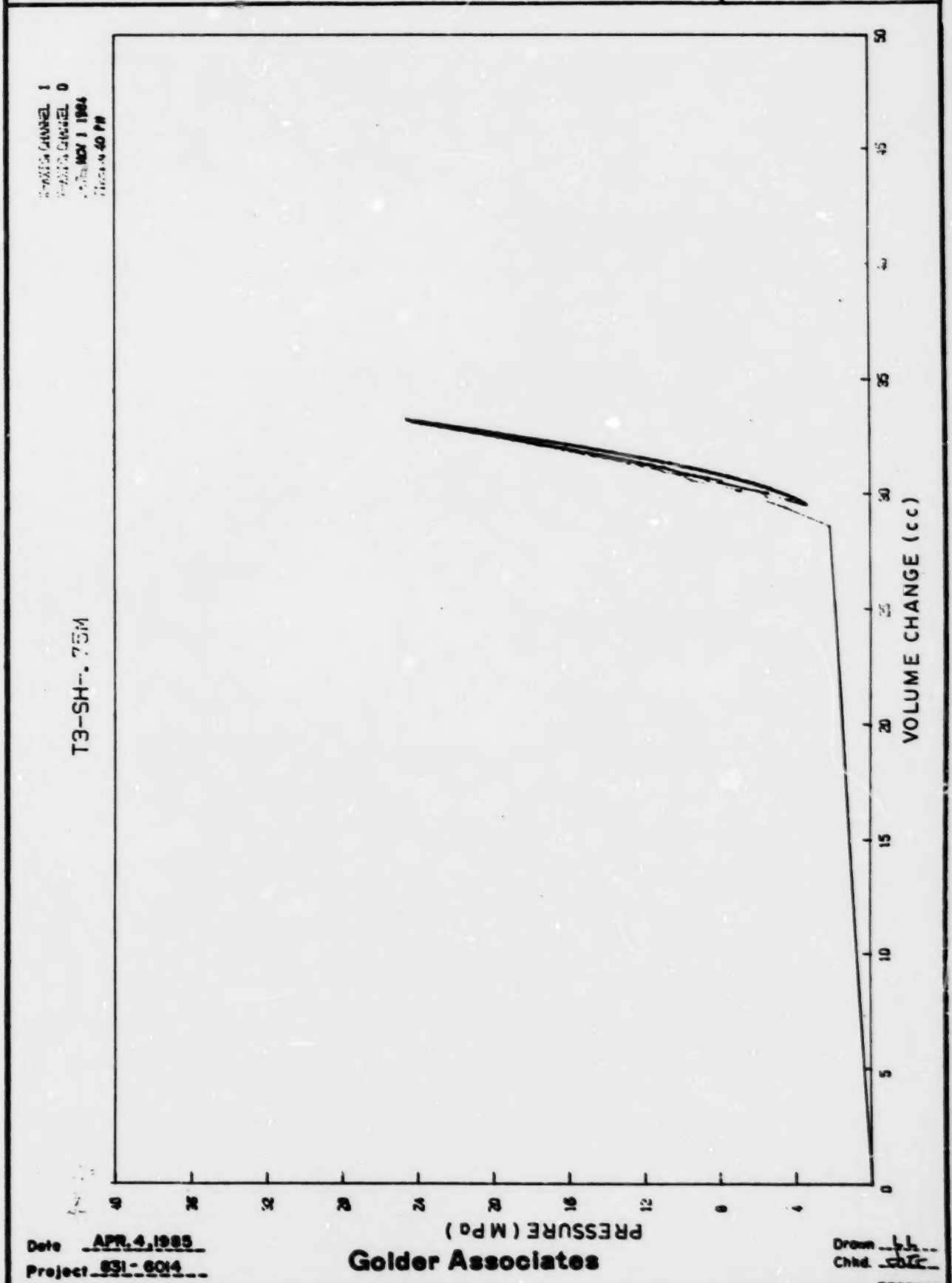
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. DKC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-.75M

FIGURE D.2



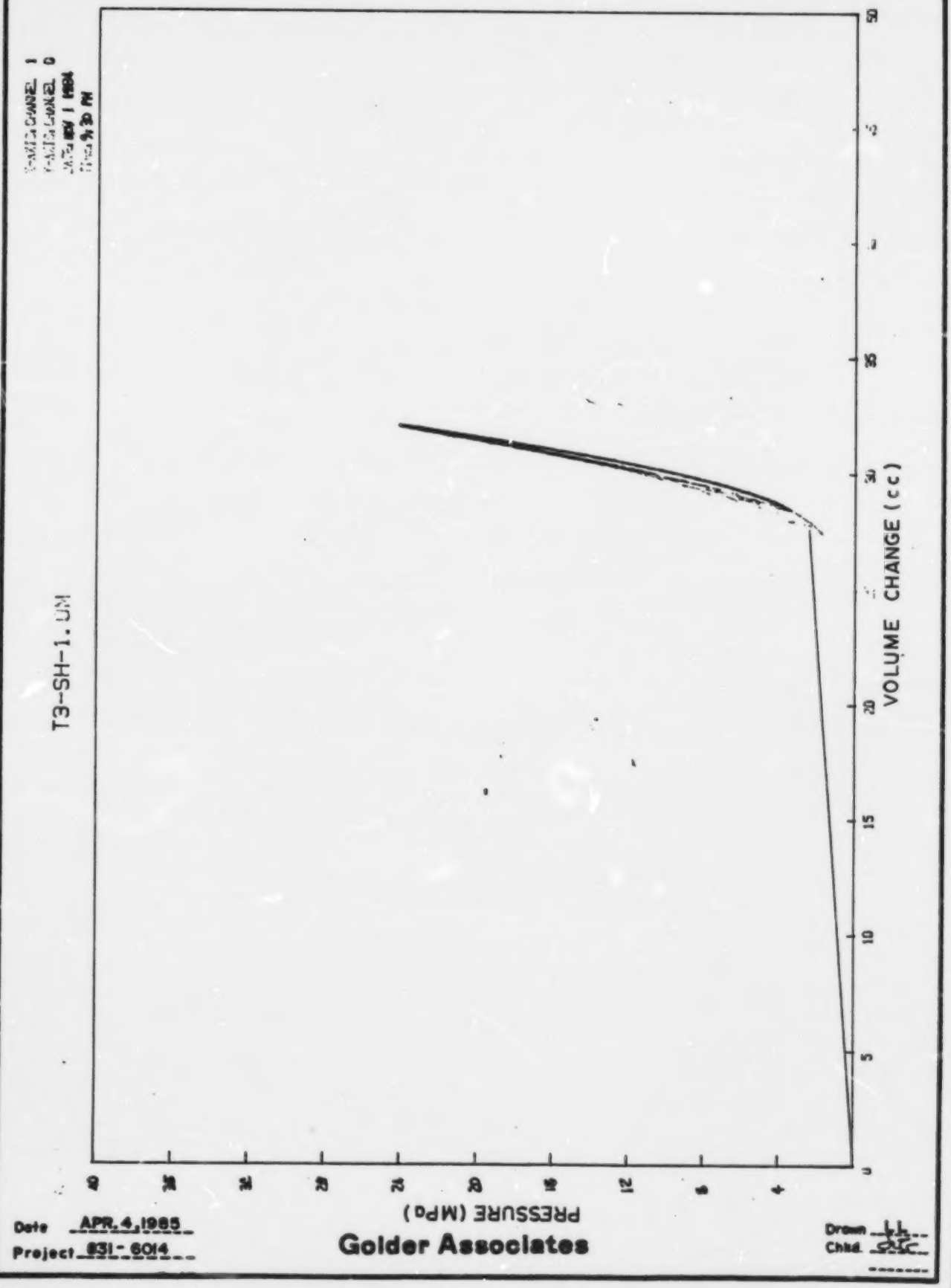
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn bh
Chkd. cbfc

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-1.0M

FIGURE D.3



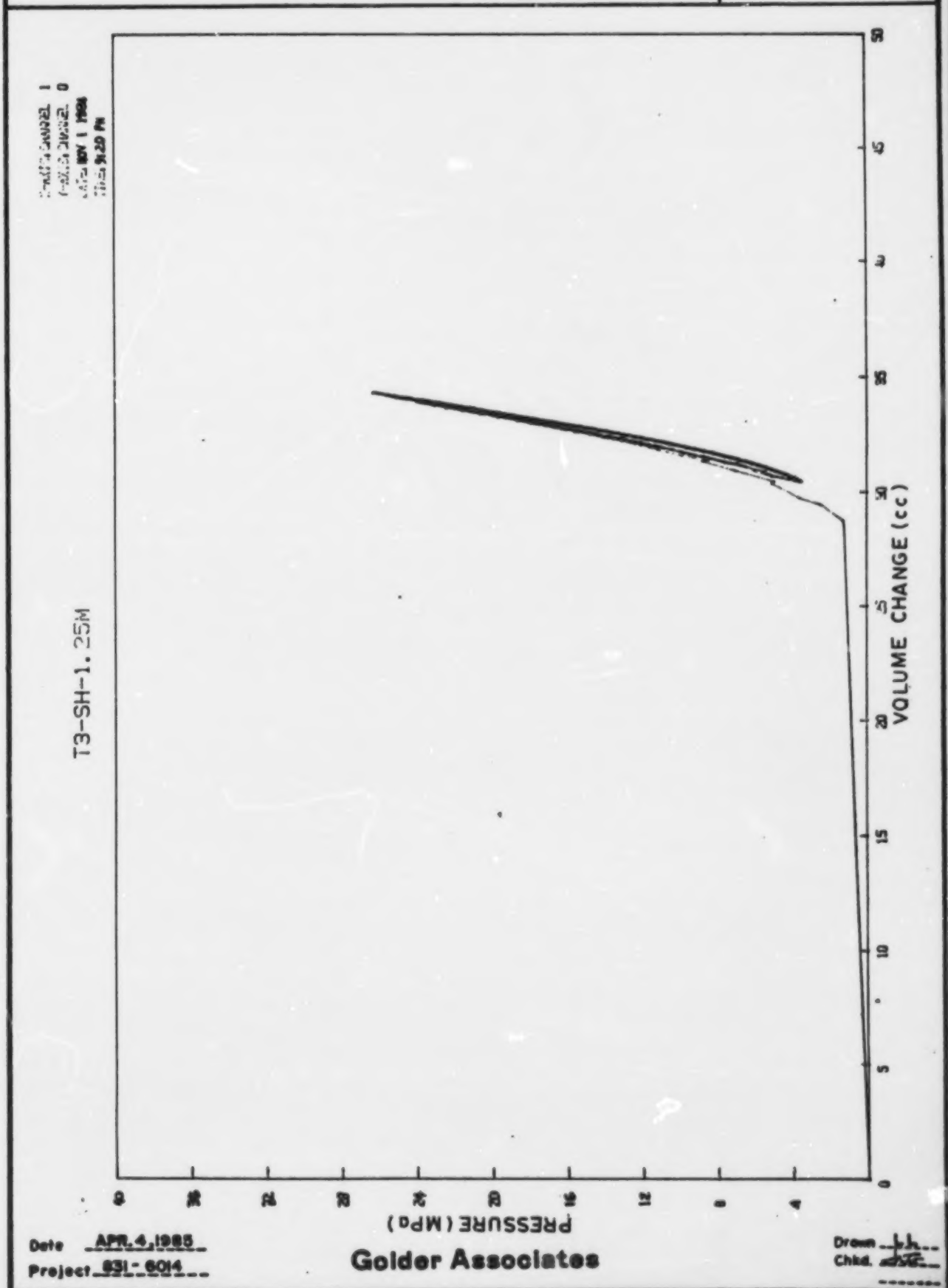
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-1.25M

FIGURE D.4



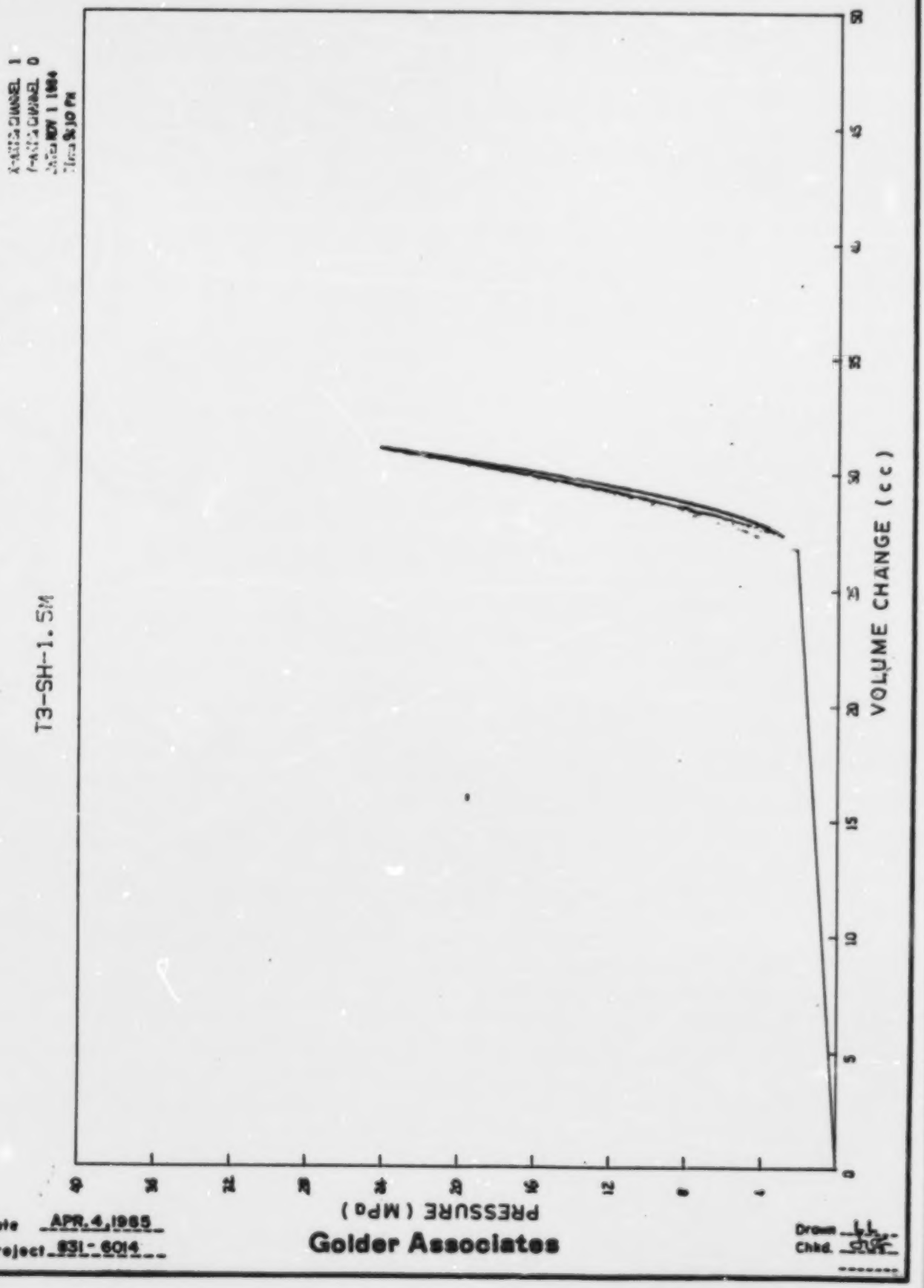
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-1.5M

FIGURE D.5



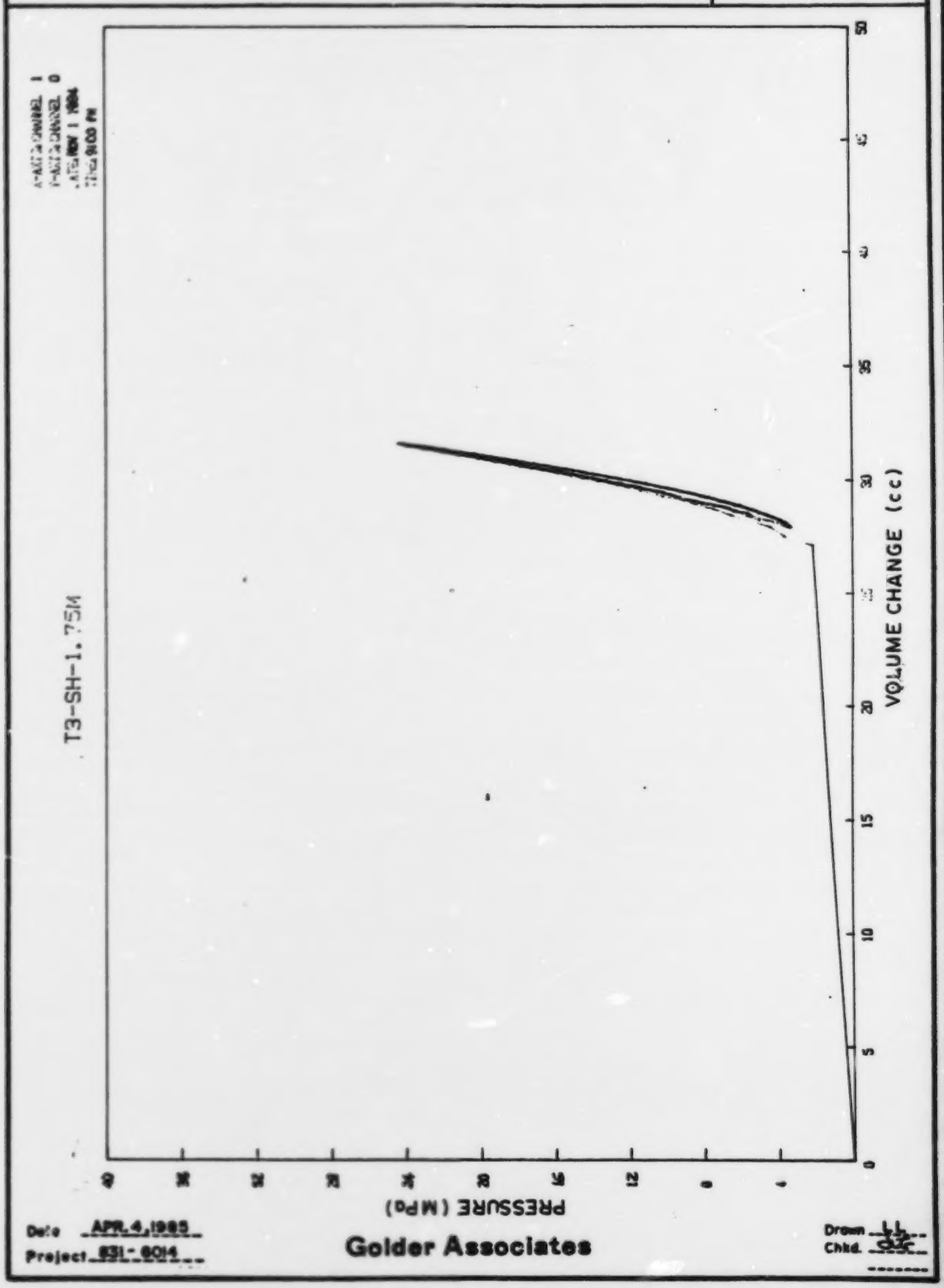
Date APR. 4, 1985
Project 931-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-1.75M

FIGURE D.6



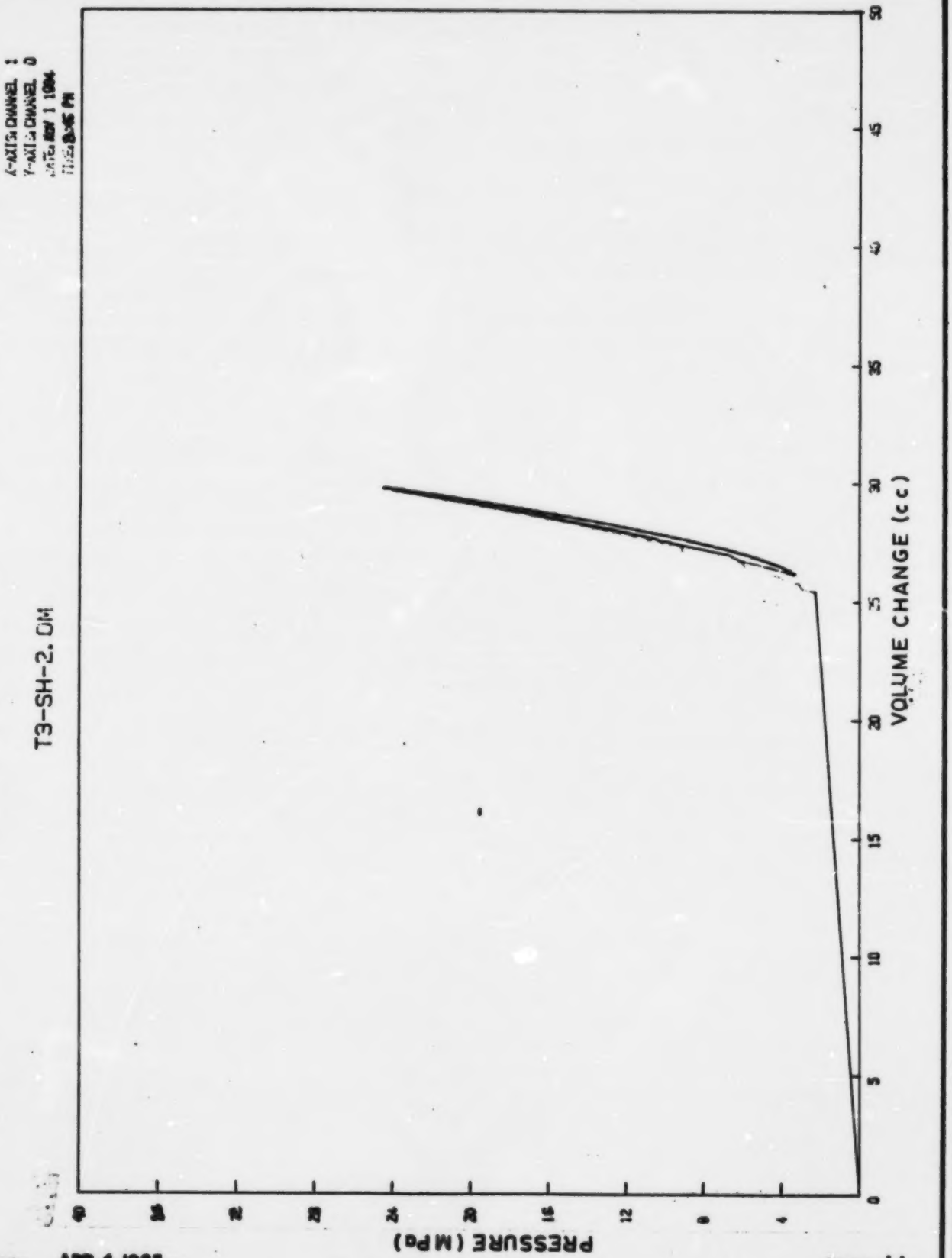
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. GJC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-2.0M

FIGURE D.7



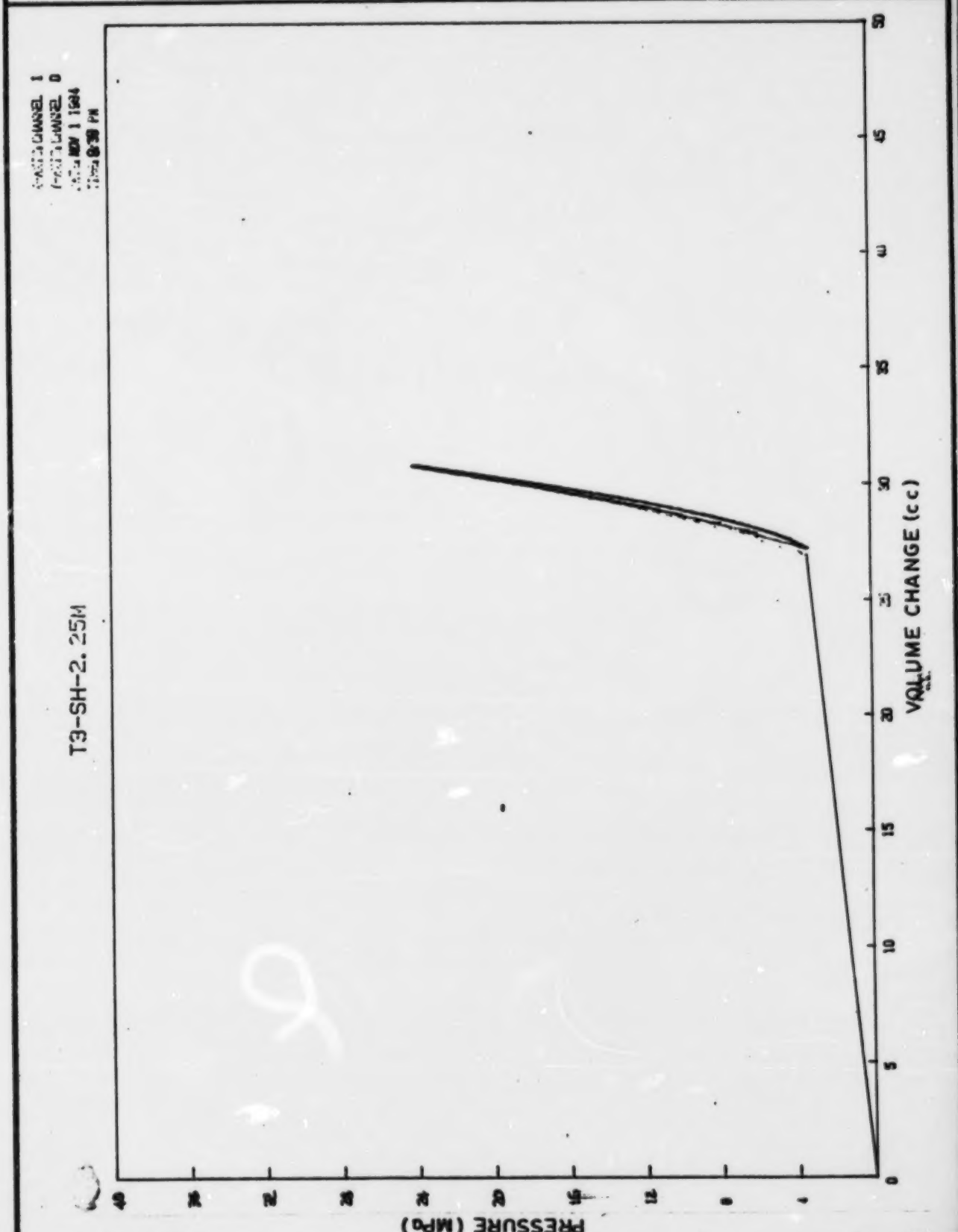
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-2.25M

FIGURE D.8



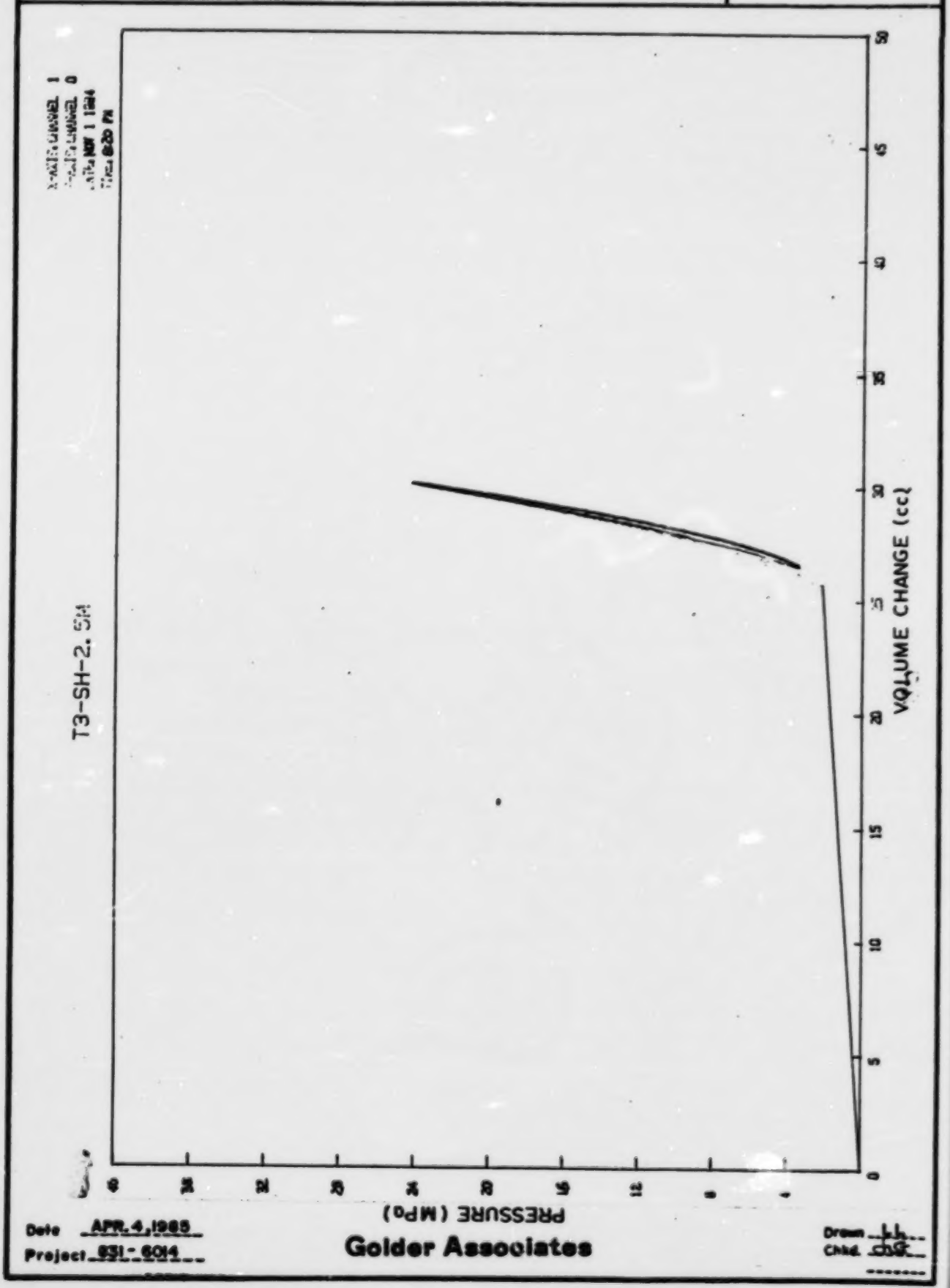
Date APR. 4, 1985
Project 931-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-2.5M

FIGURE D.9



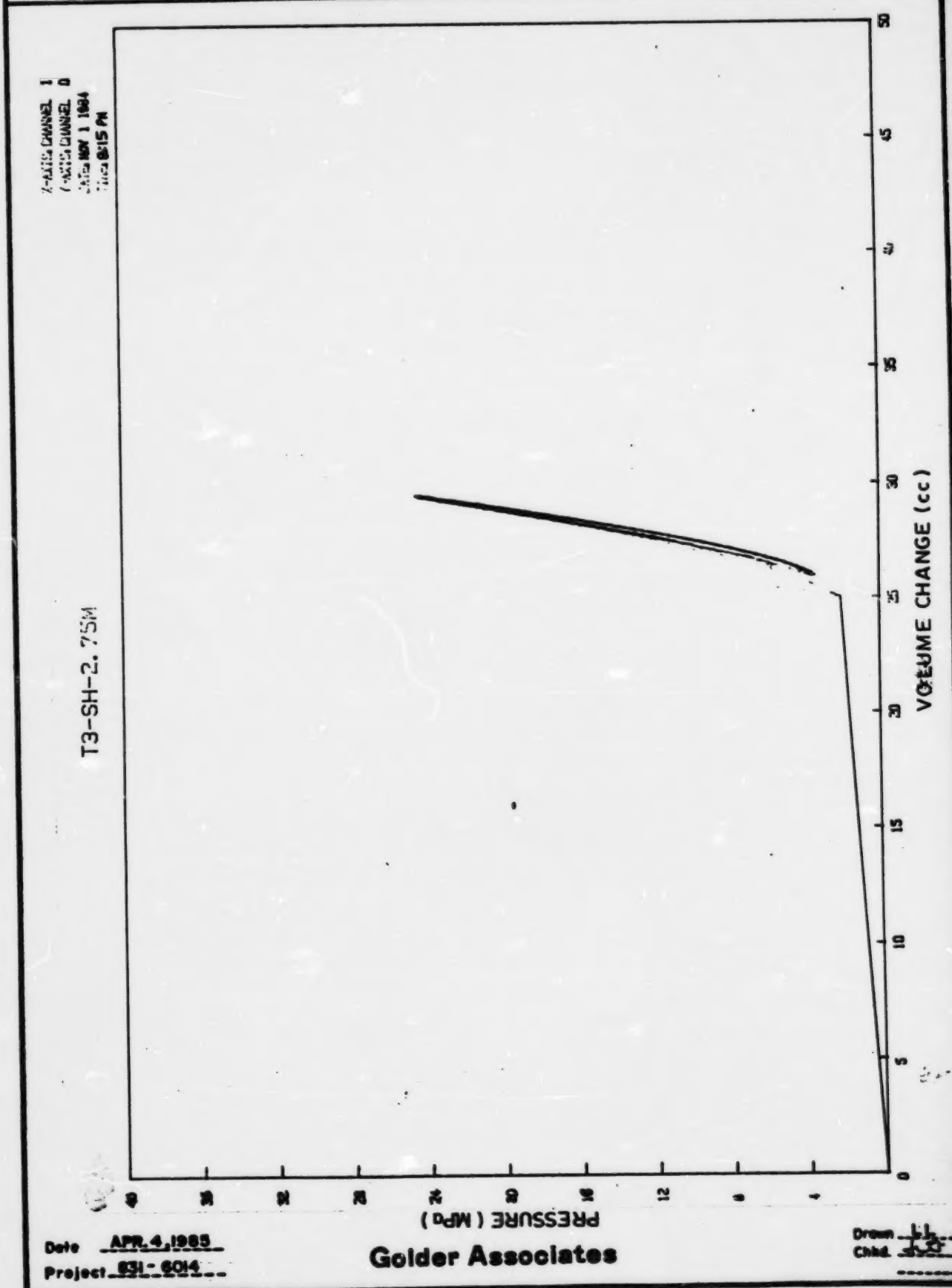
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. CDS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-2.75M

FIGURE D.10



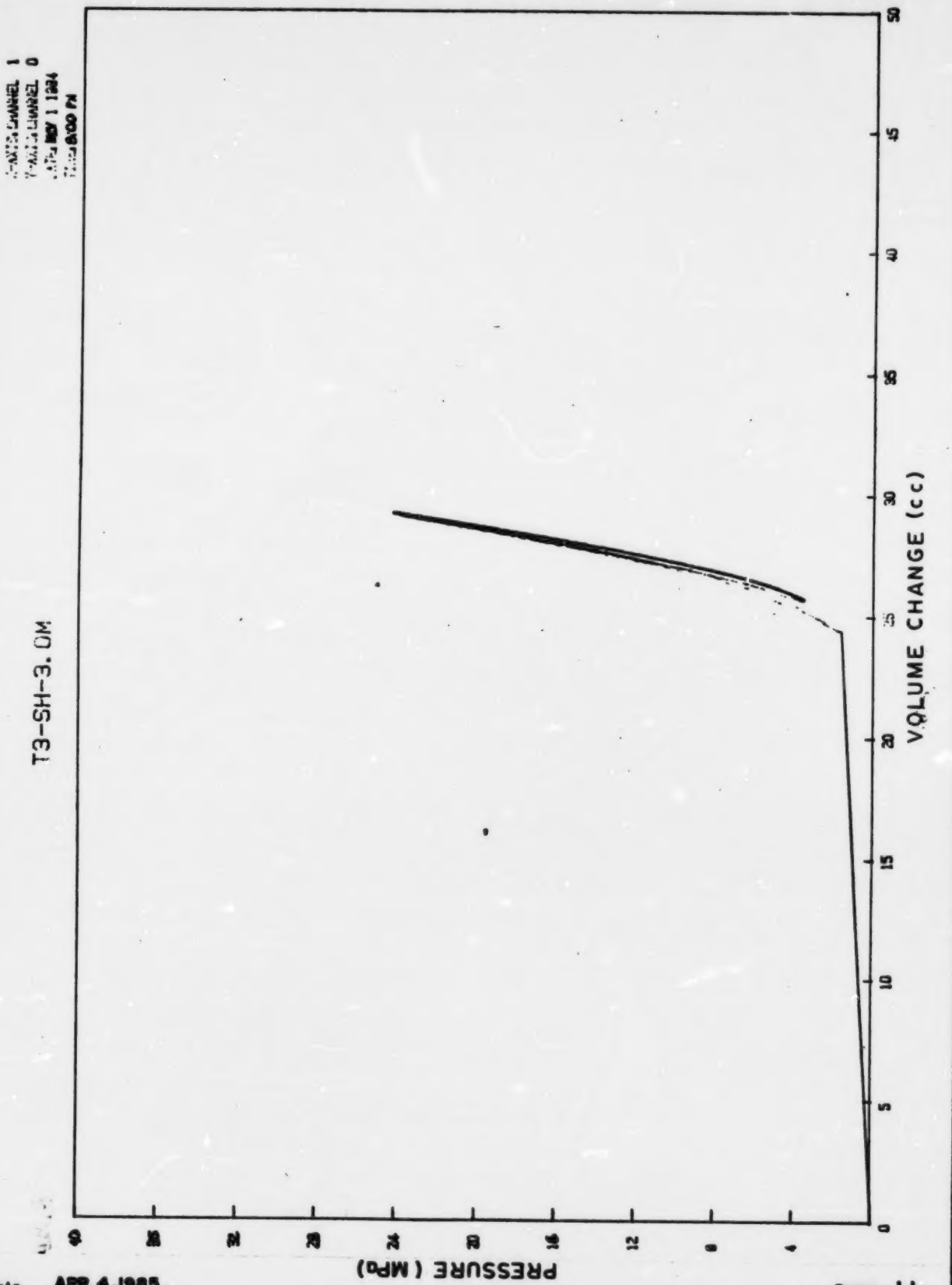
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-3.0M

FIGURE D.11



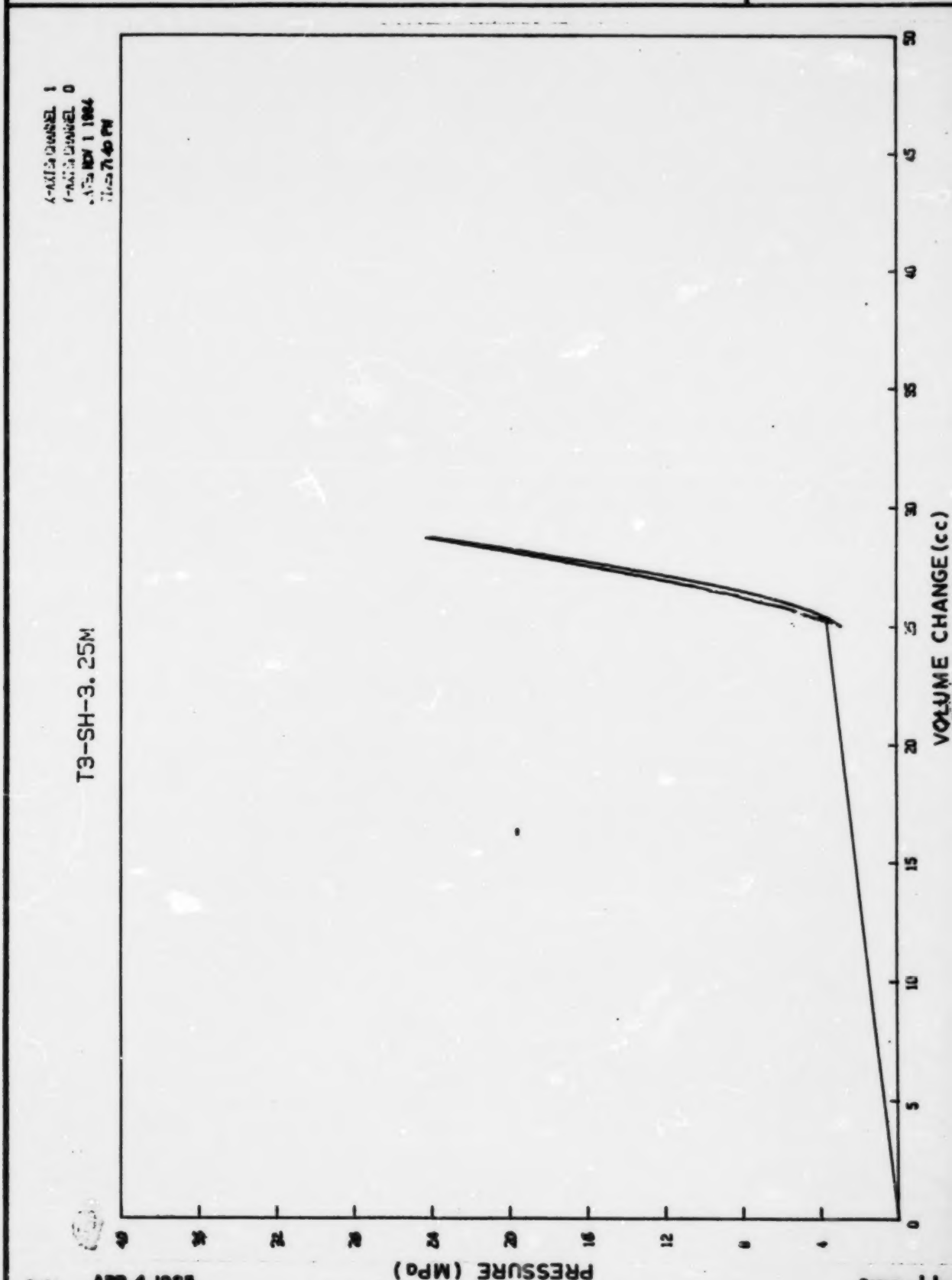
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. GVG

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-3.25M

FIGURE D.12



Date APR. 4, 1985

Project 831-6014

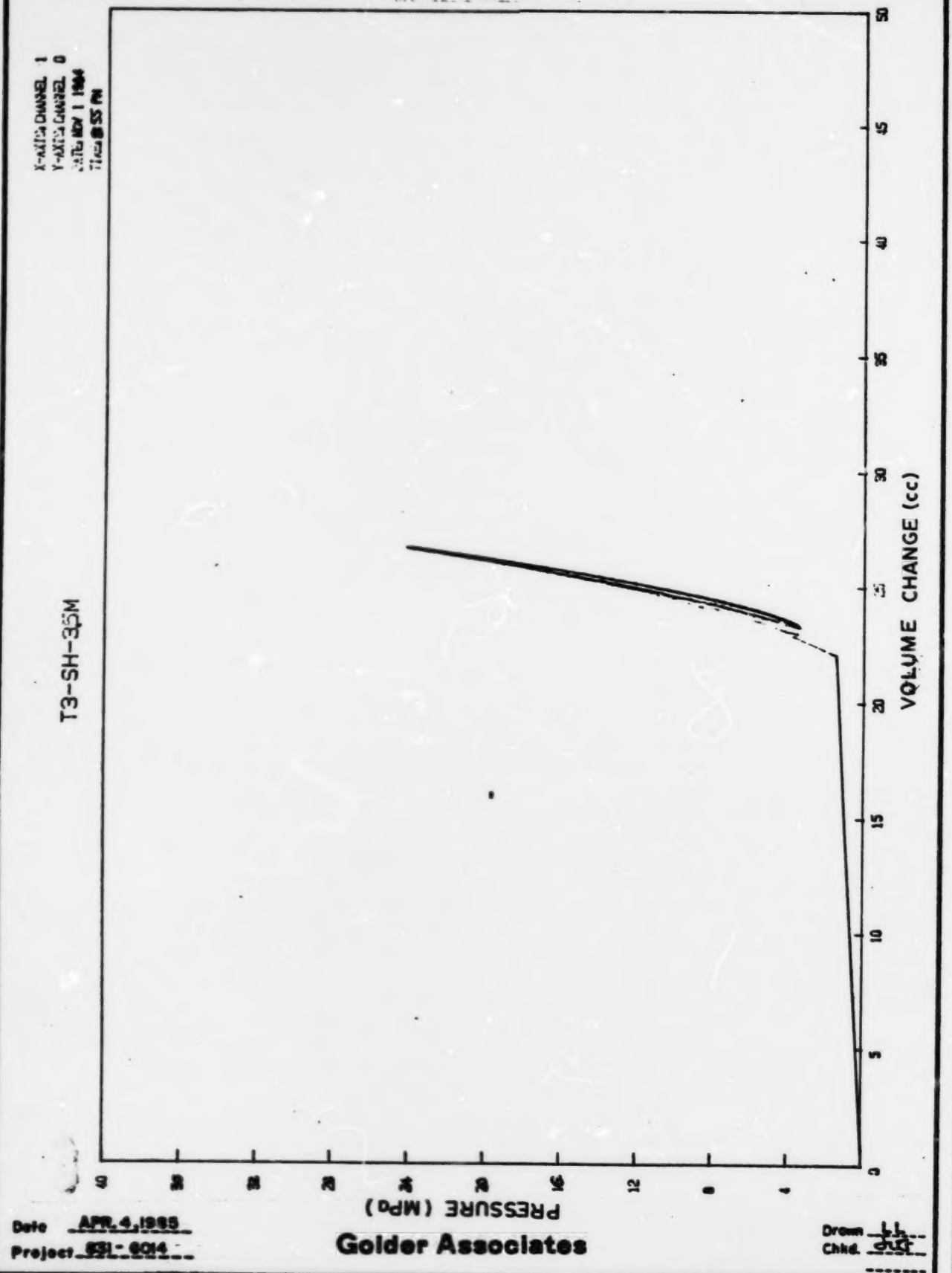
Golder Associates

Drawn LL

Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-3.5M

FIGURE D.13



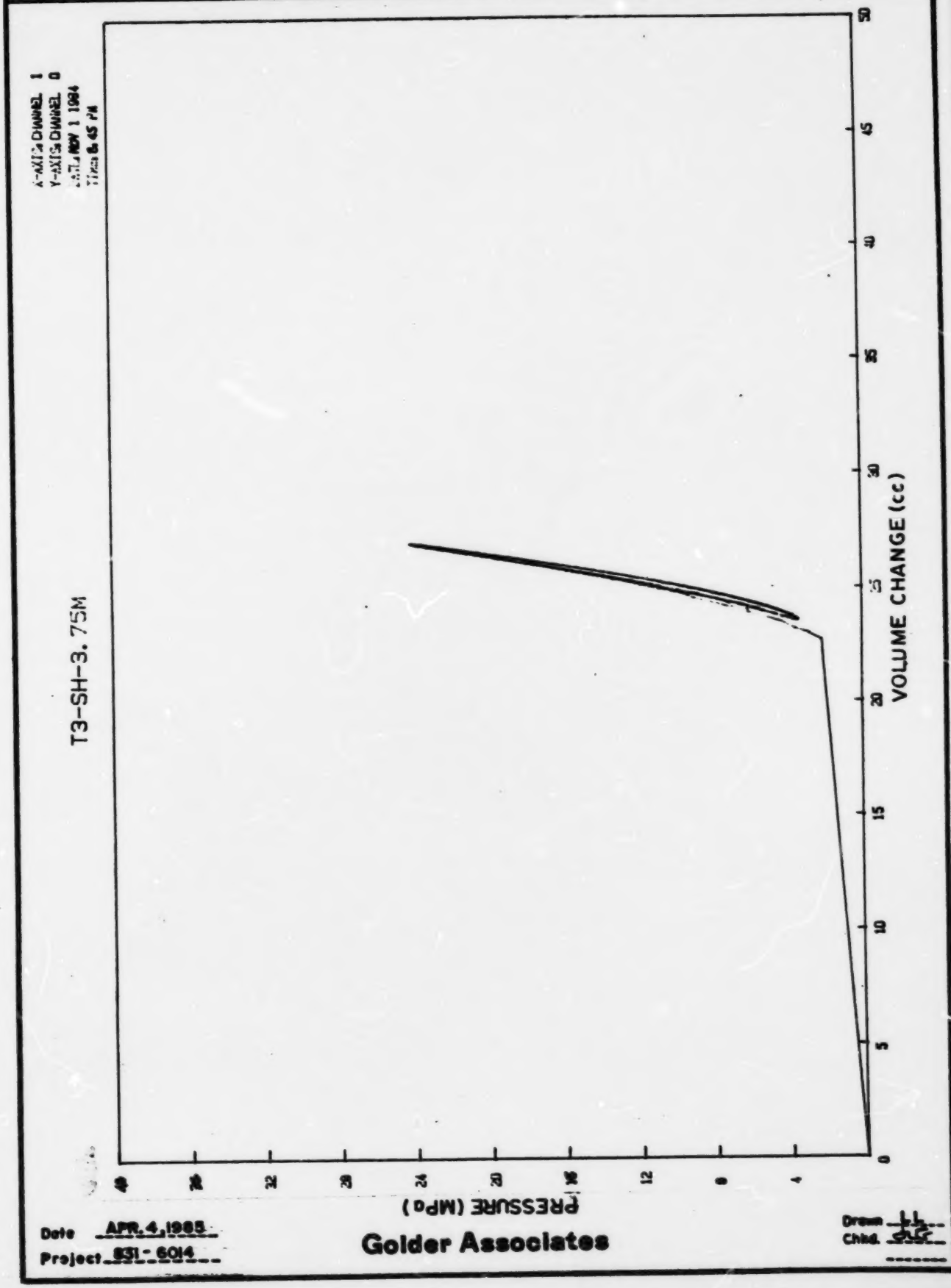
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-3.75 M

FIGURE D:14



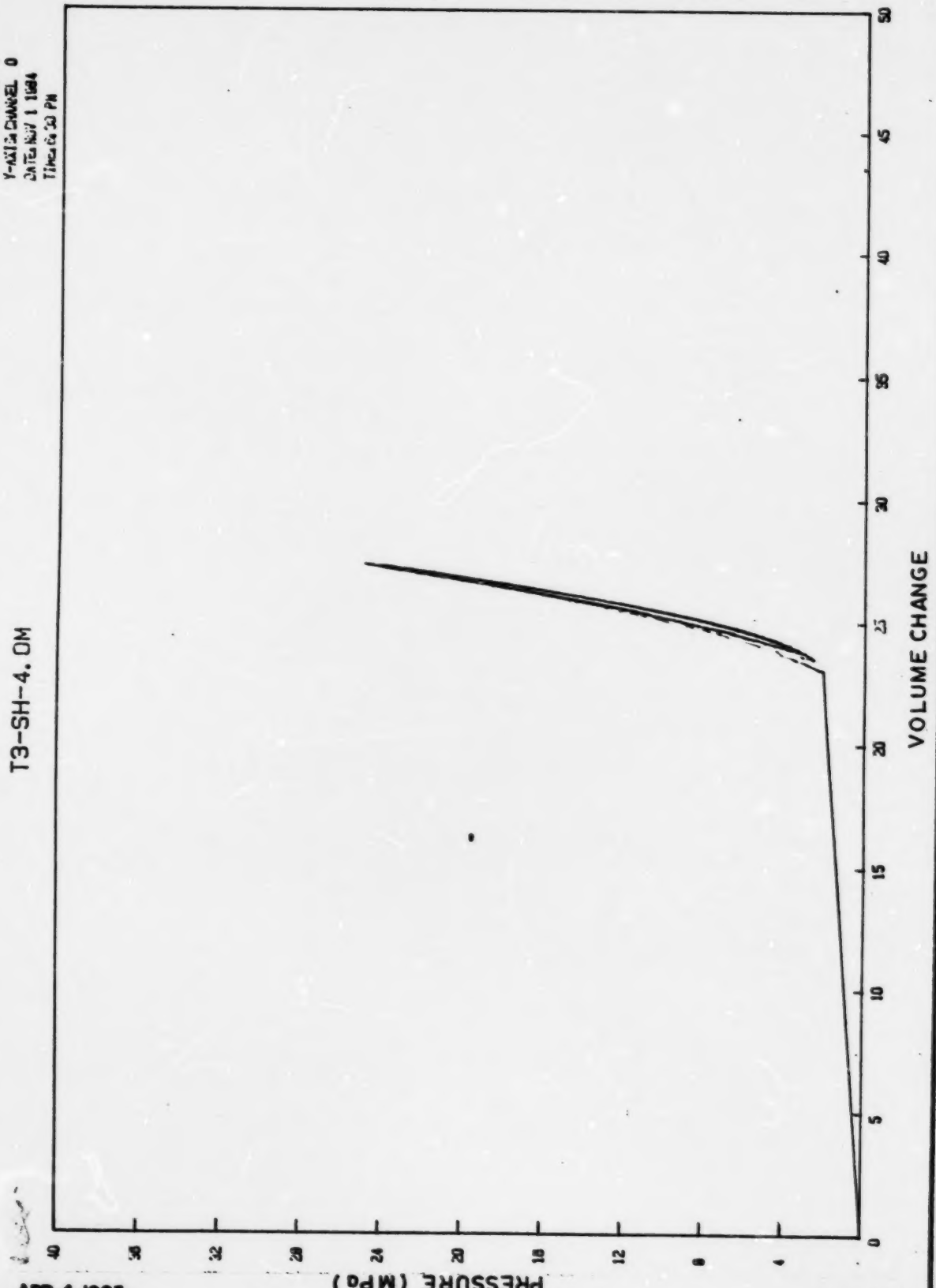
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-4.0M

FIGURE D.15



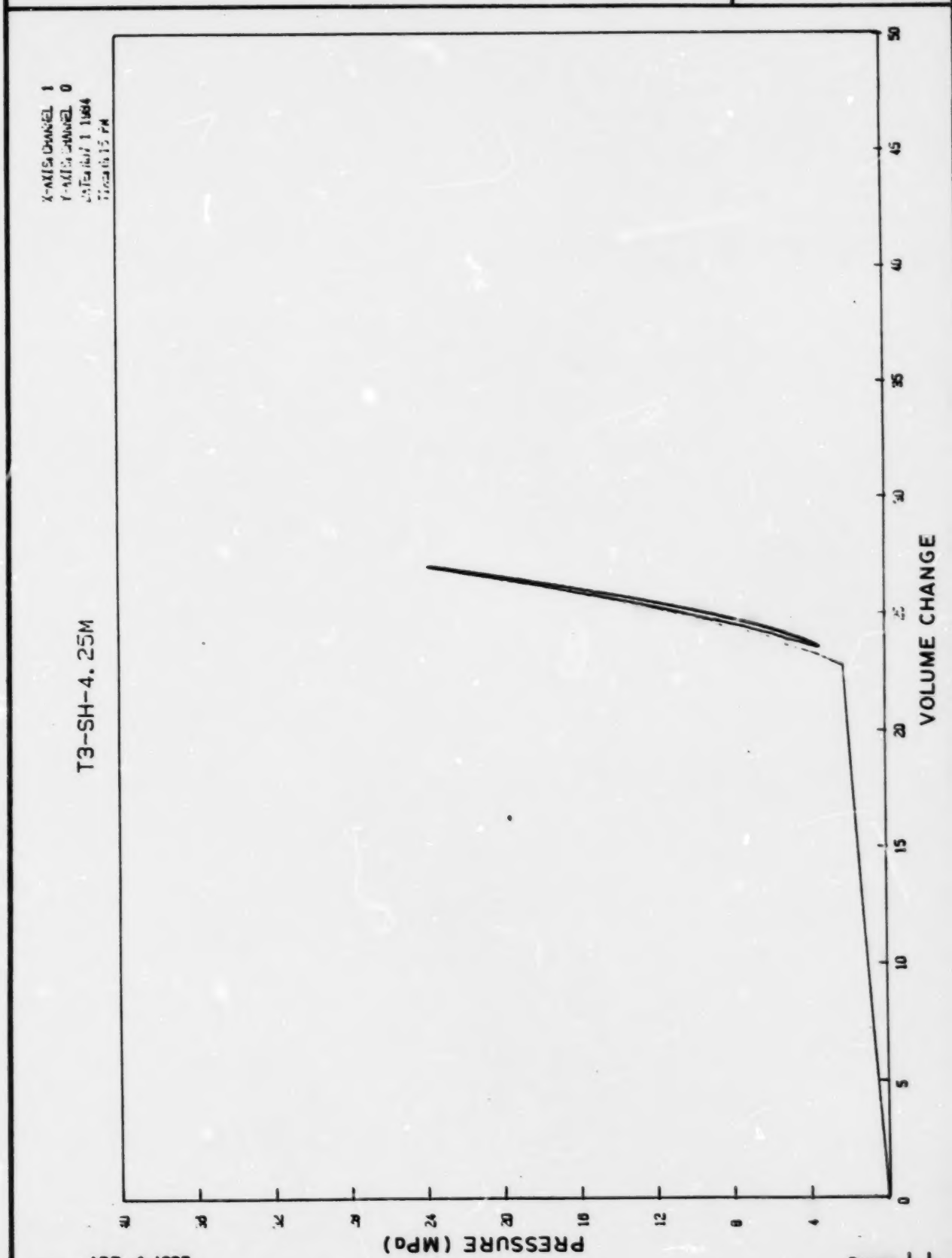
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST No. T3-SH-4.25M

FIGURE D.16



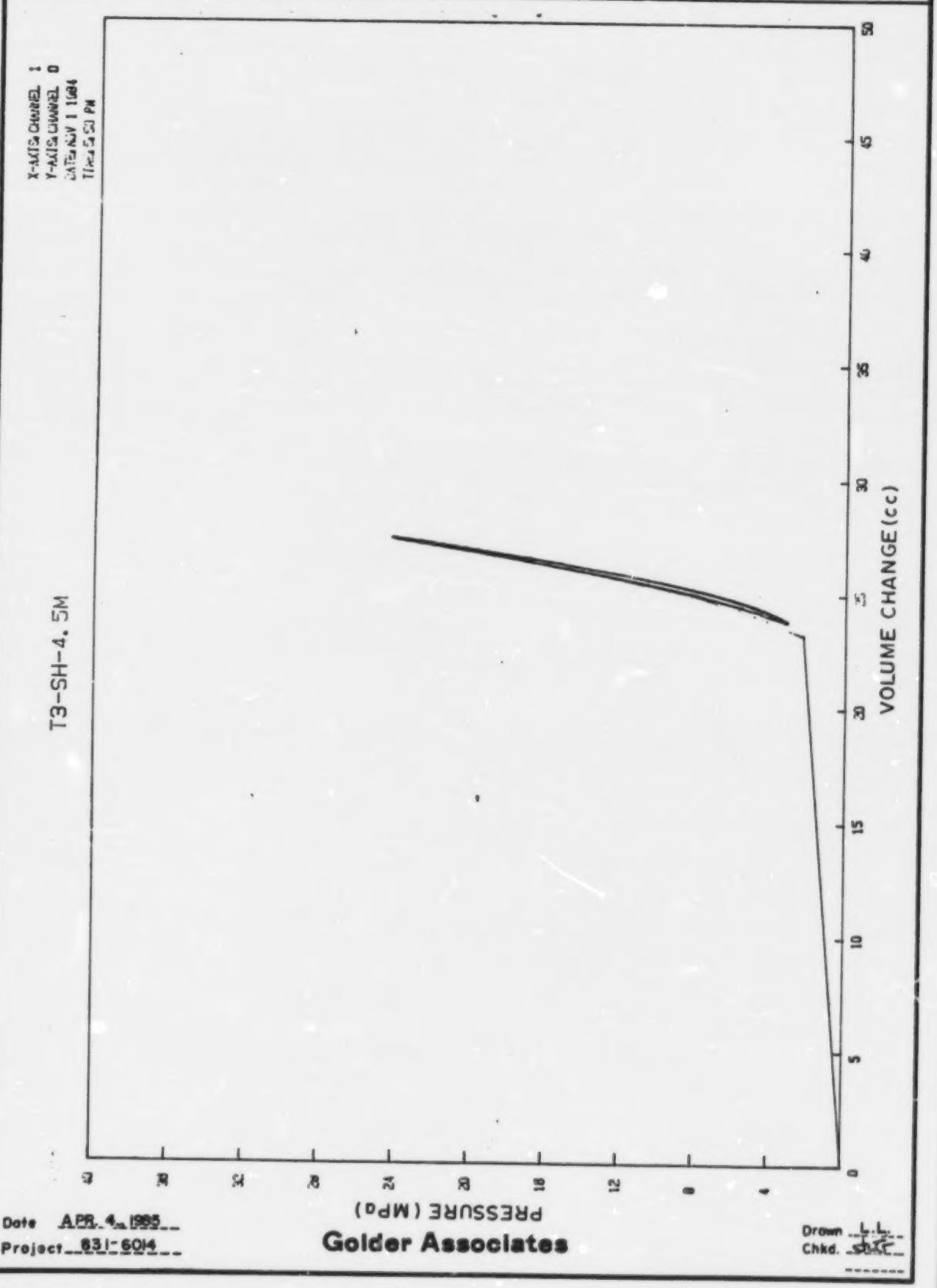
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn L.L.
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST No. T3-SH-4.5M

FIGURE D.17



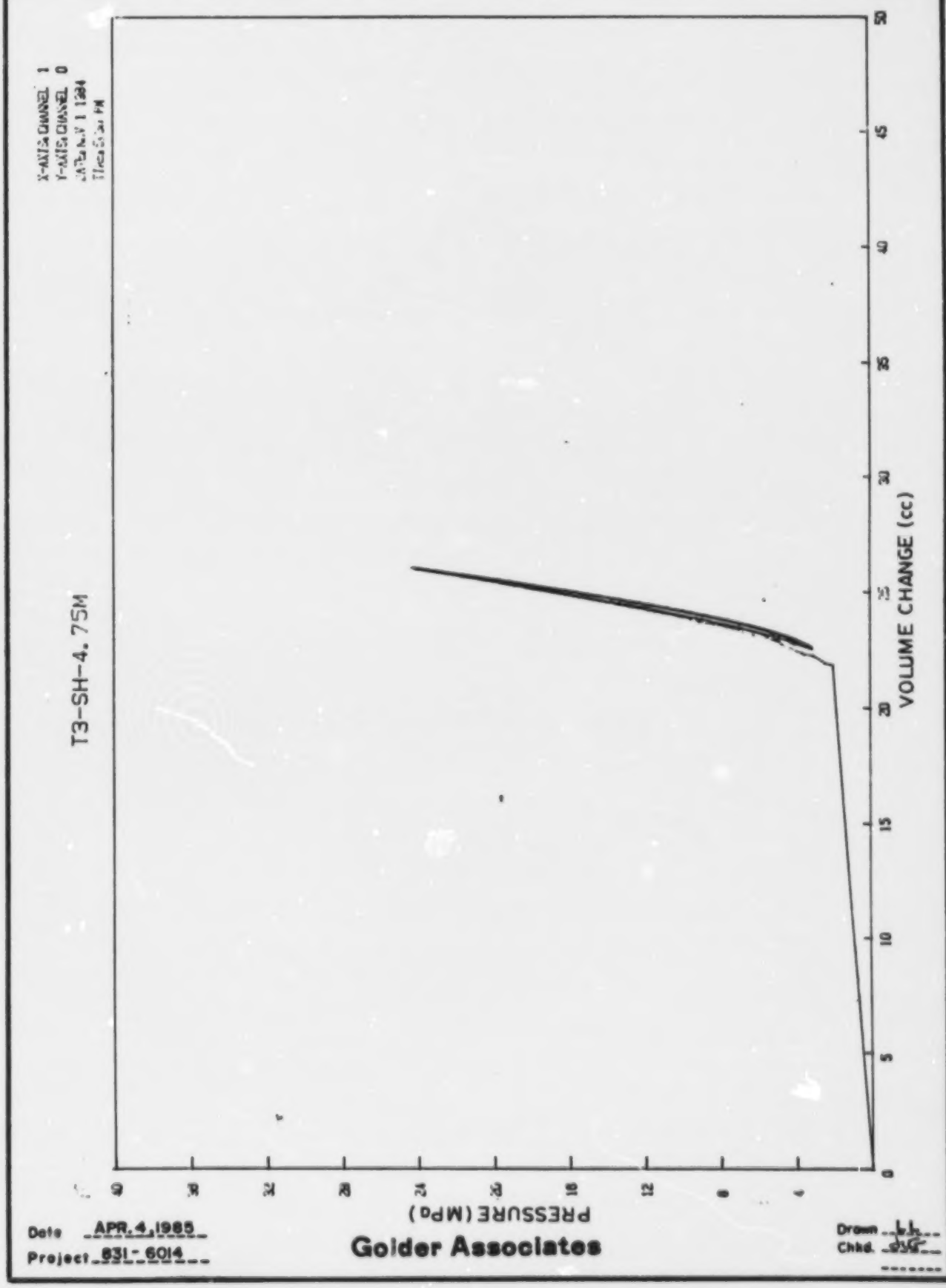
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn L.L.
Chkd. S.K.C.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-4.75M

FIGURE D. 18



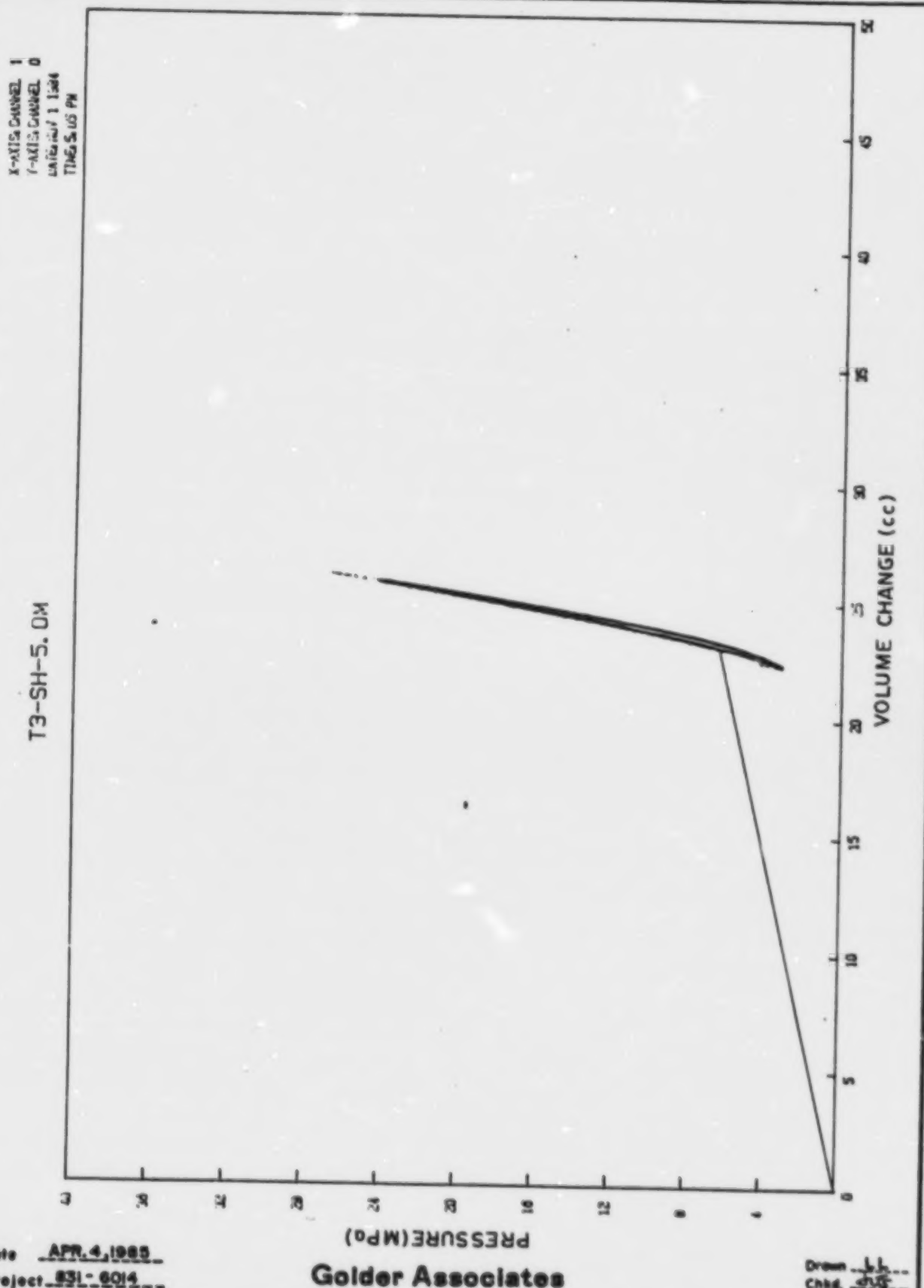
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. DJC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-5.0M

FIGURE D:19



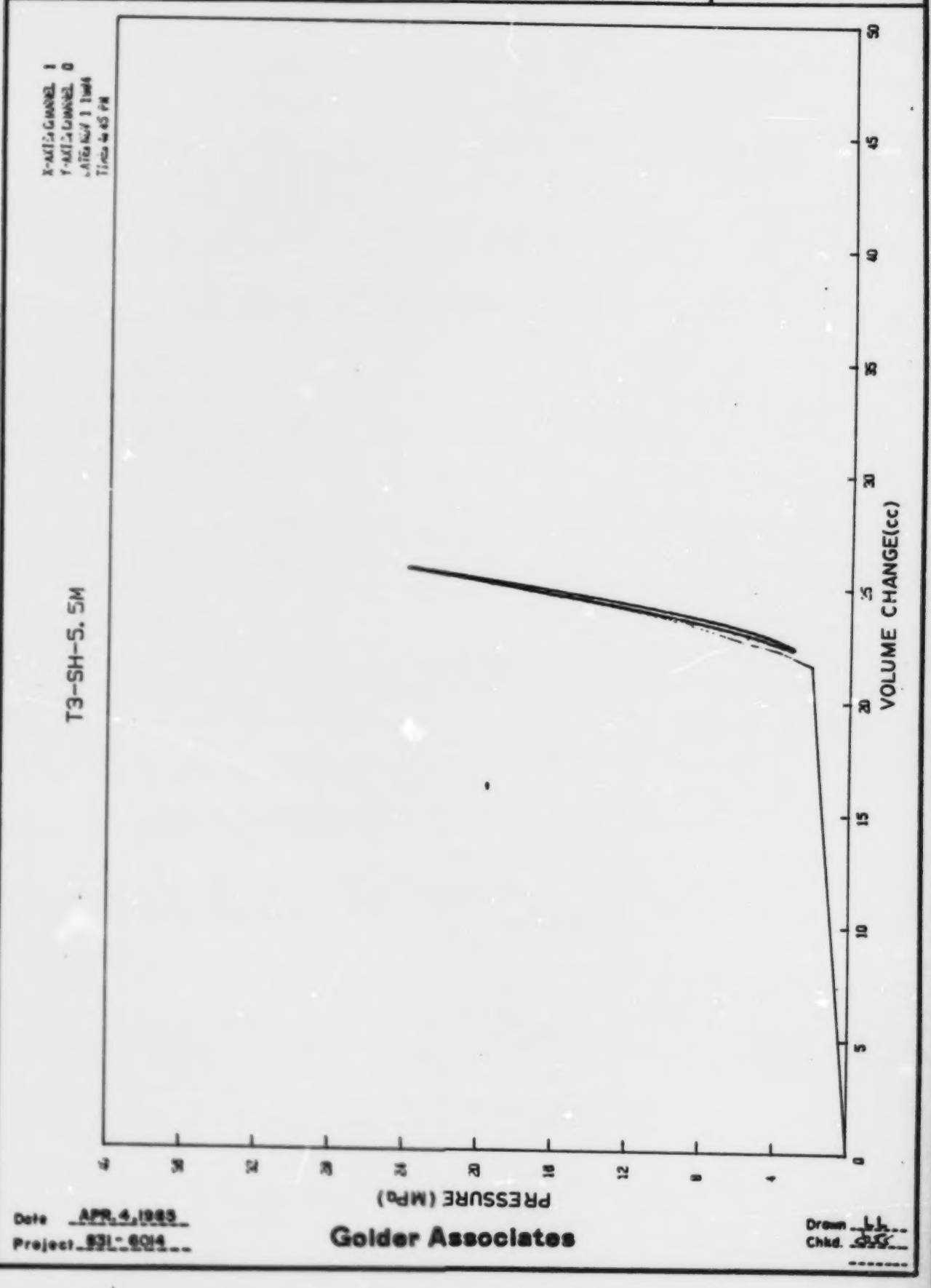
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn JJ
Chkd. GVG

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-5.5M

FIGURE D.20



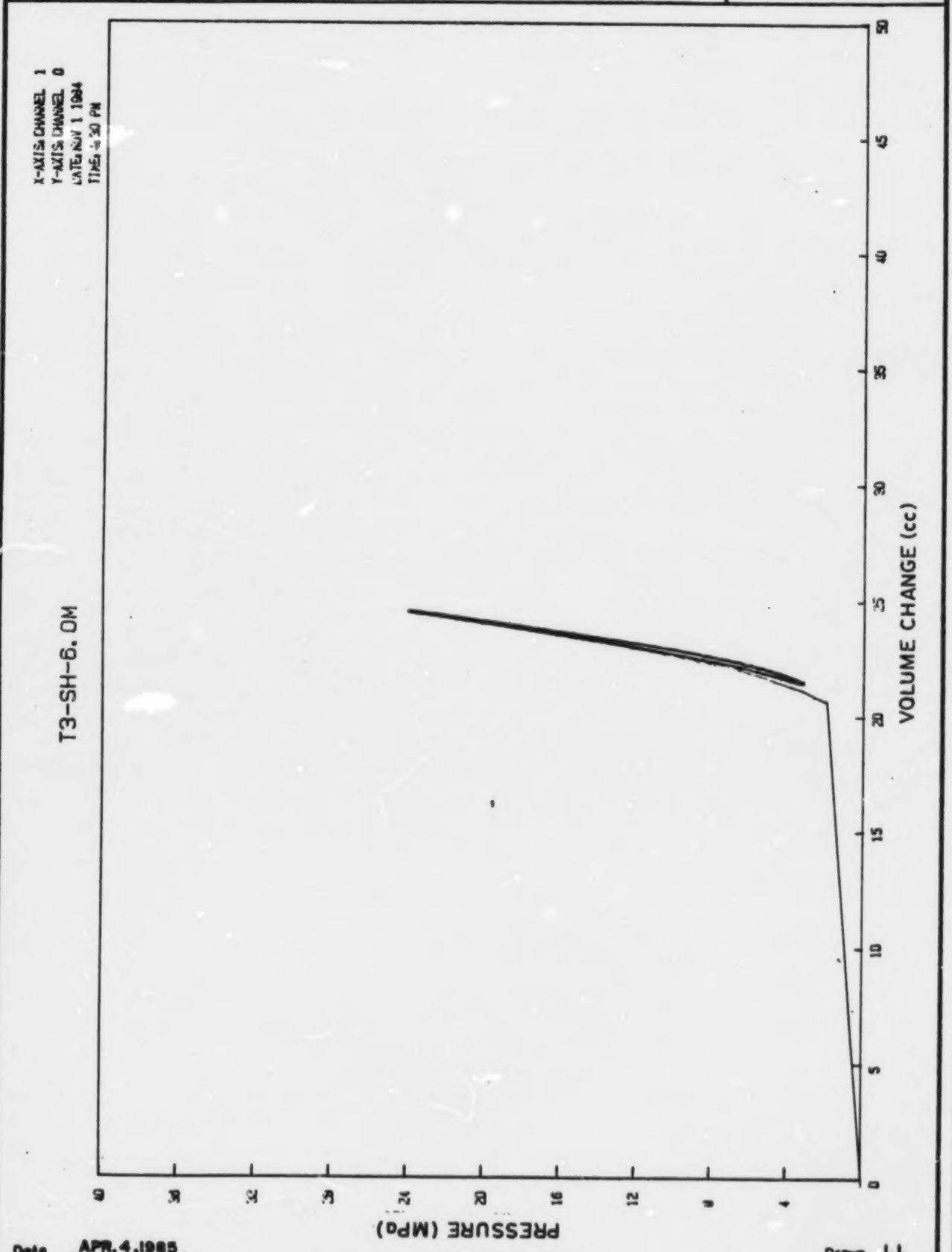
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. GVG

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-6.0M

FIGURE D.21



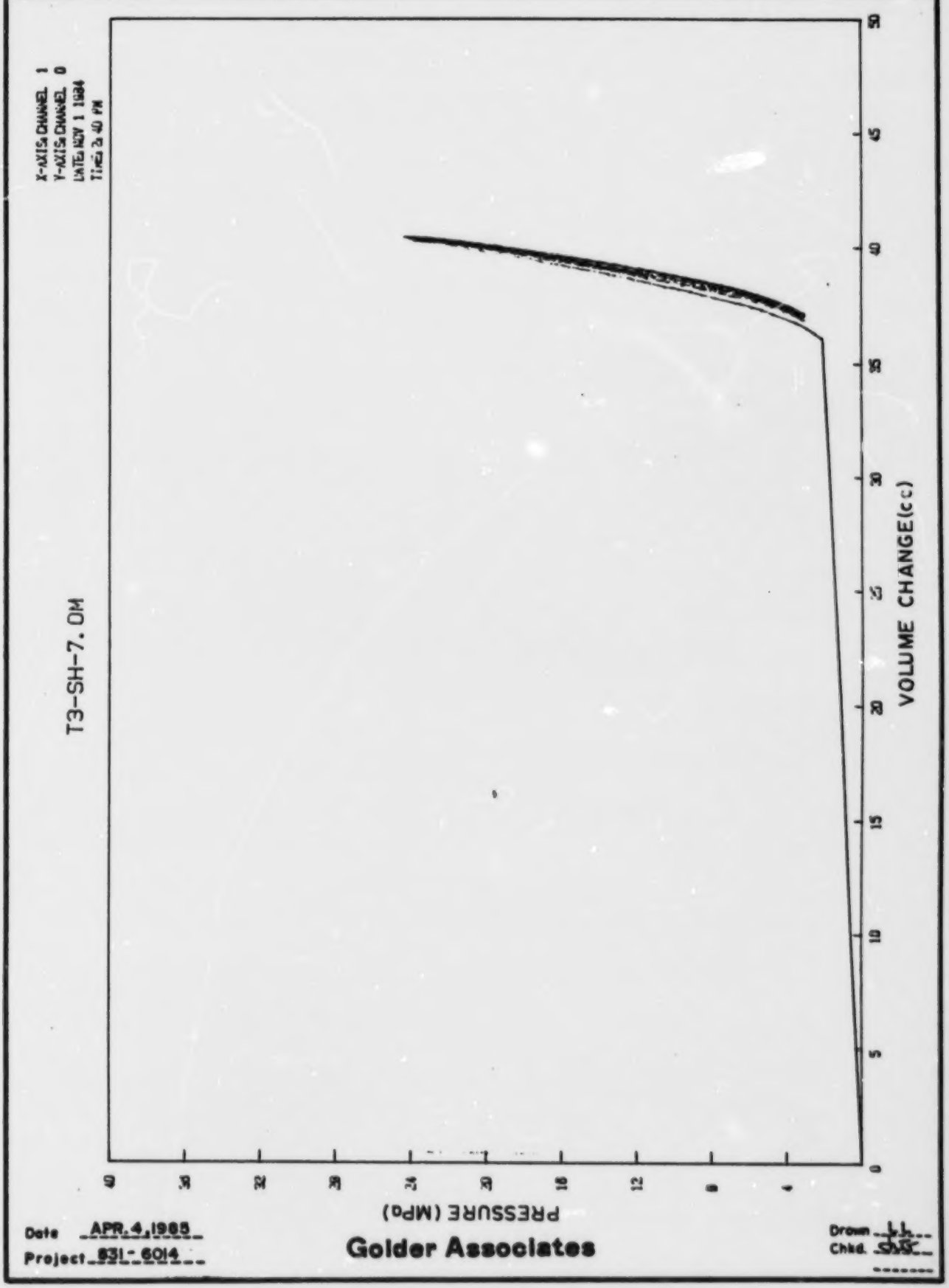
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. JJF

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-7.0M

FIGURE D.22



Date APR.4,1988

Project 831-6014

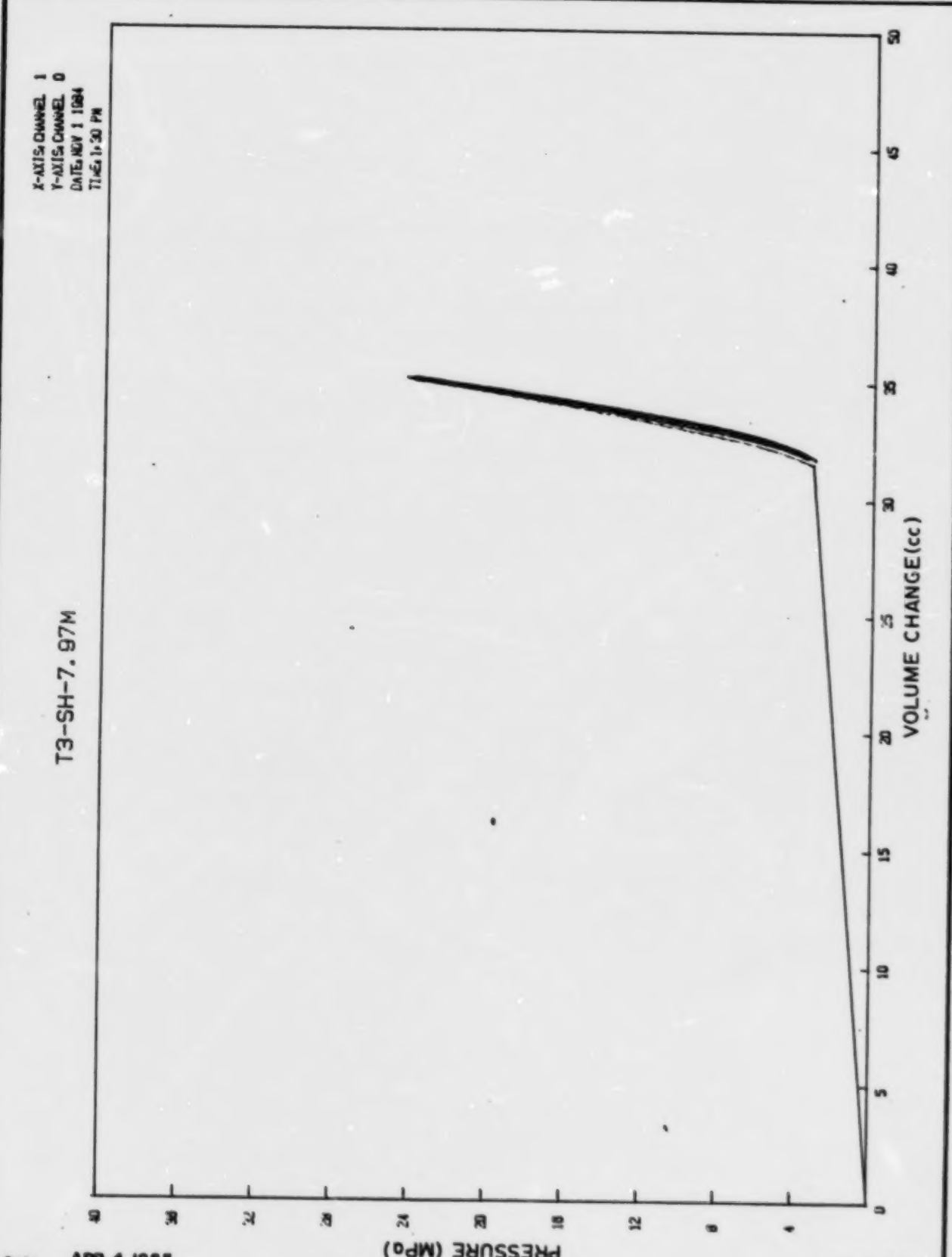
Golder Associates

Drawn LL

Chkd. SMC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-7.97

FIGURE D.23



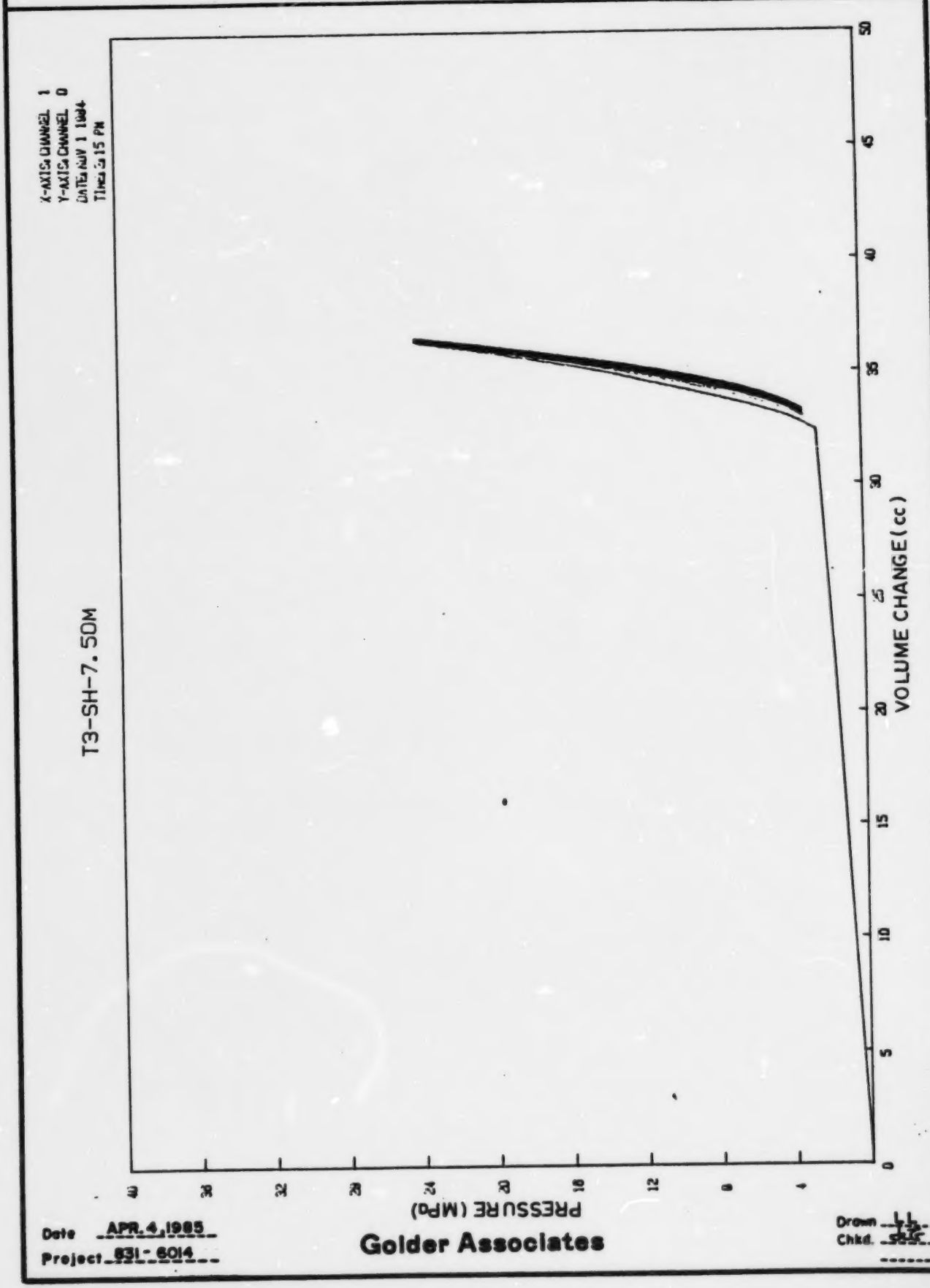
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. SHF

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-SH-7.5M

FIGURE D.24



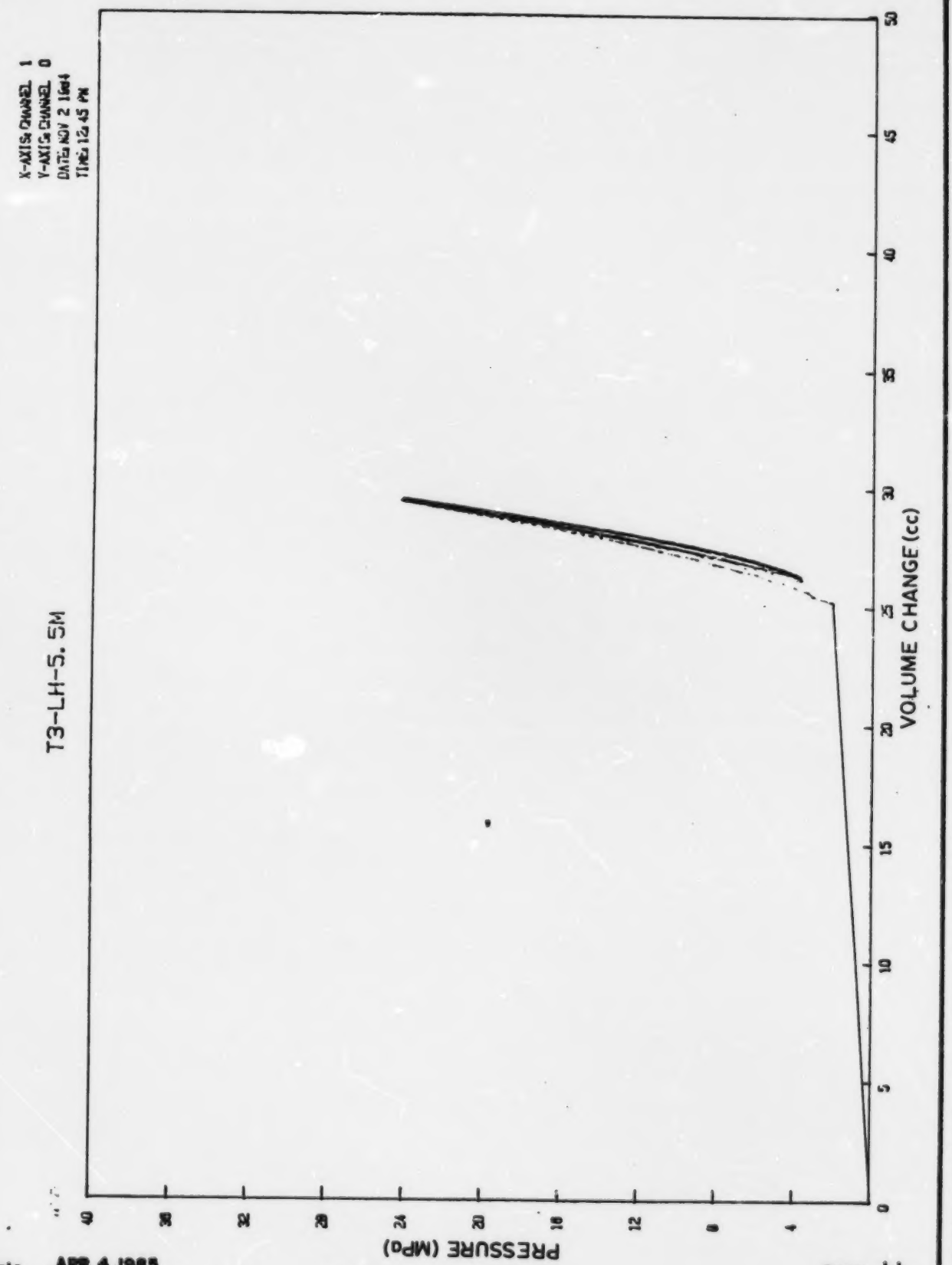
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. SHC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-LH-5.5M

FIGURE D.25



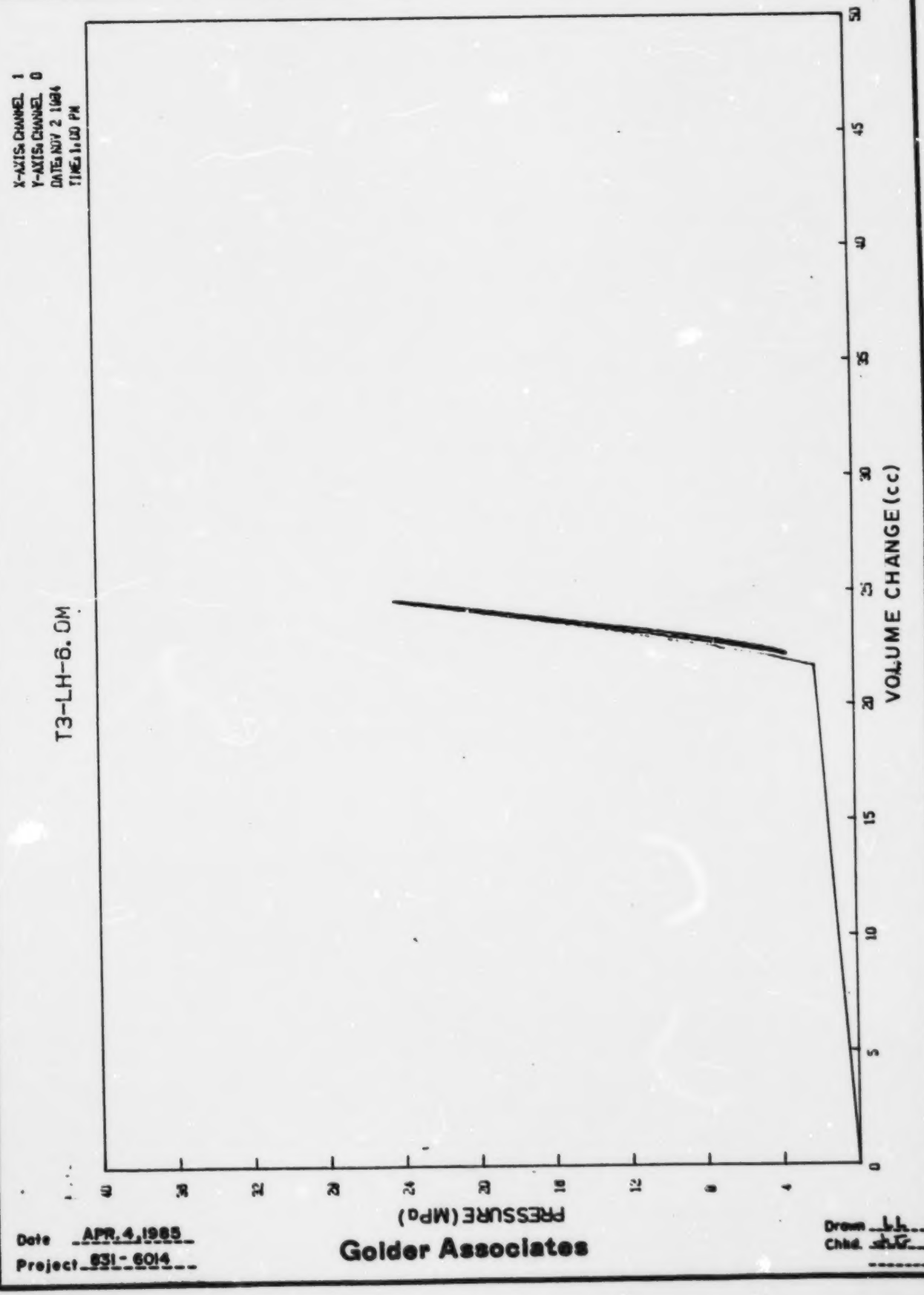
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. GVS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-LH-6.0M

FIGURE D.26



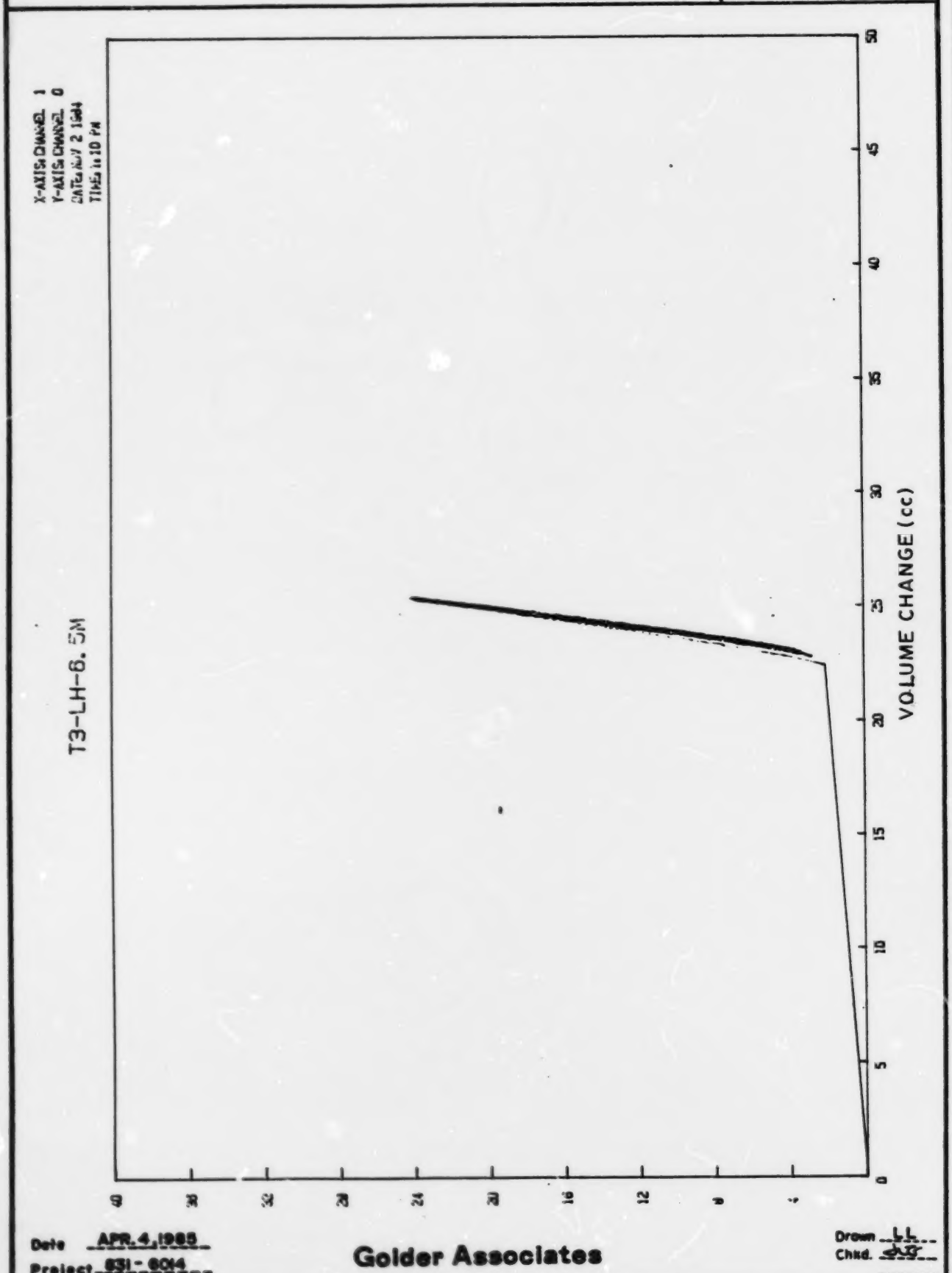
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. [illegible]

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-LH-6.5M

FIGURE D.27



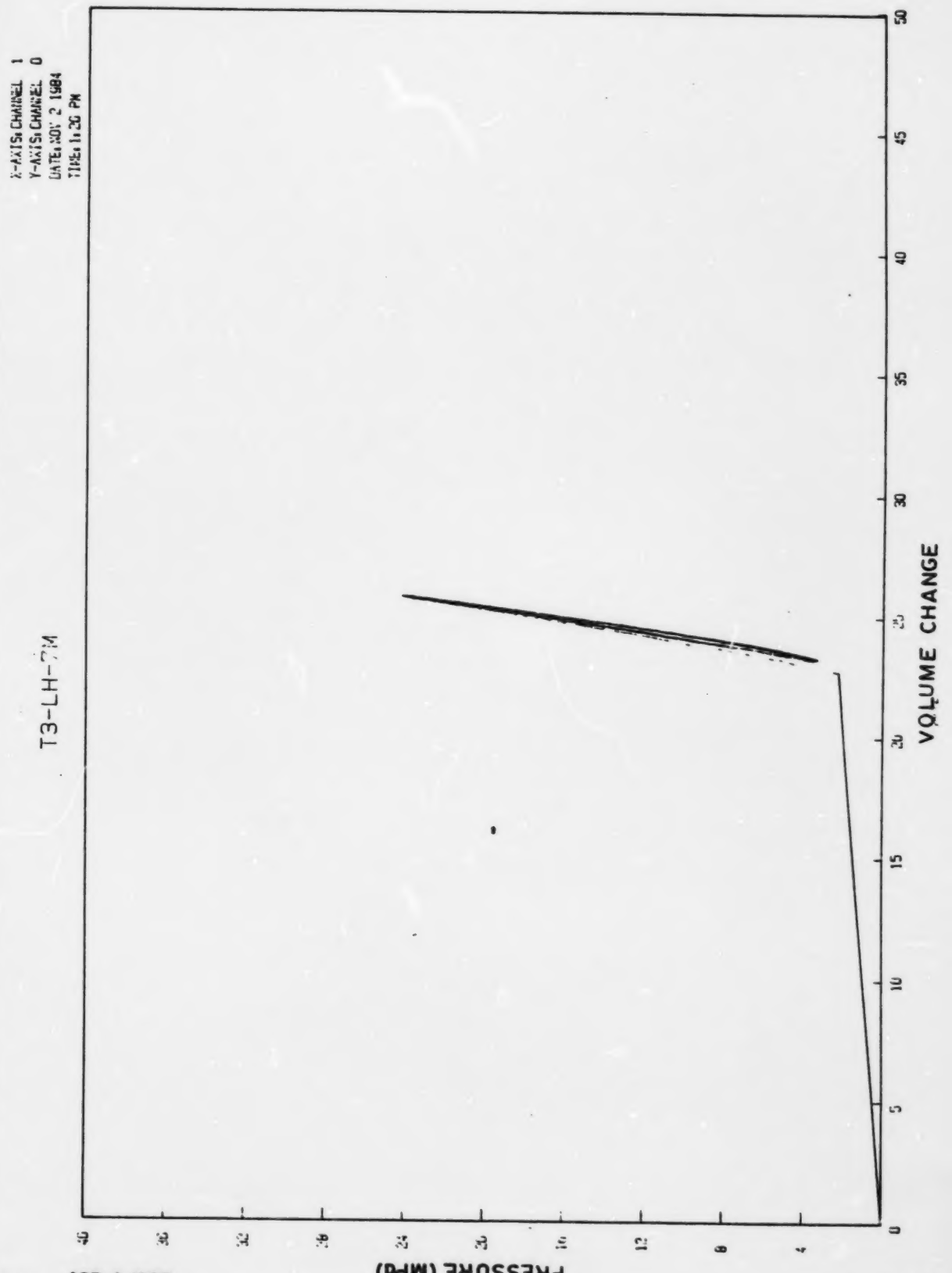
Date APR. 4, 1985
Project 851-6014

Golder Associates

Drawn LL
Chkd. GKS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-LH-7M

FIGURE D.28



Date APR. 4, 1985

Project 831-6014

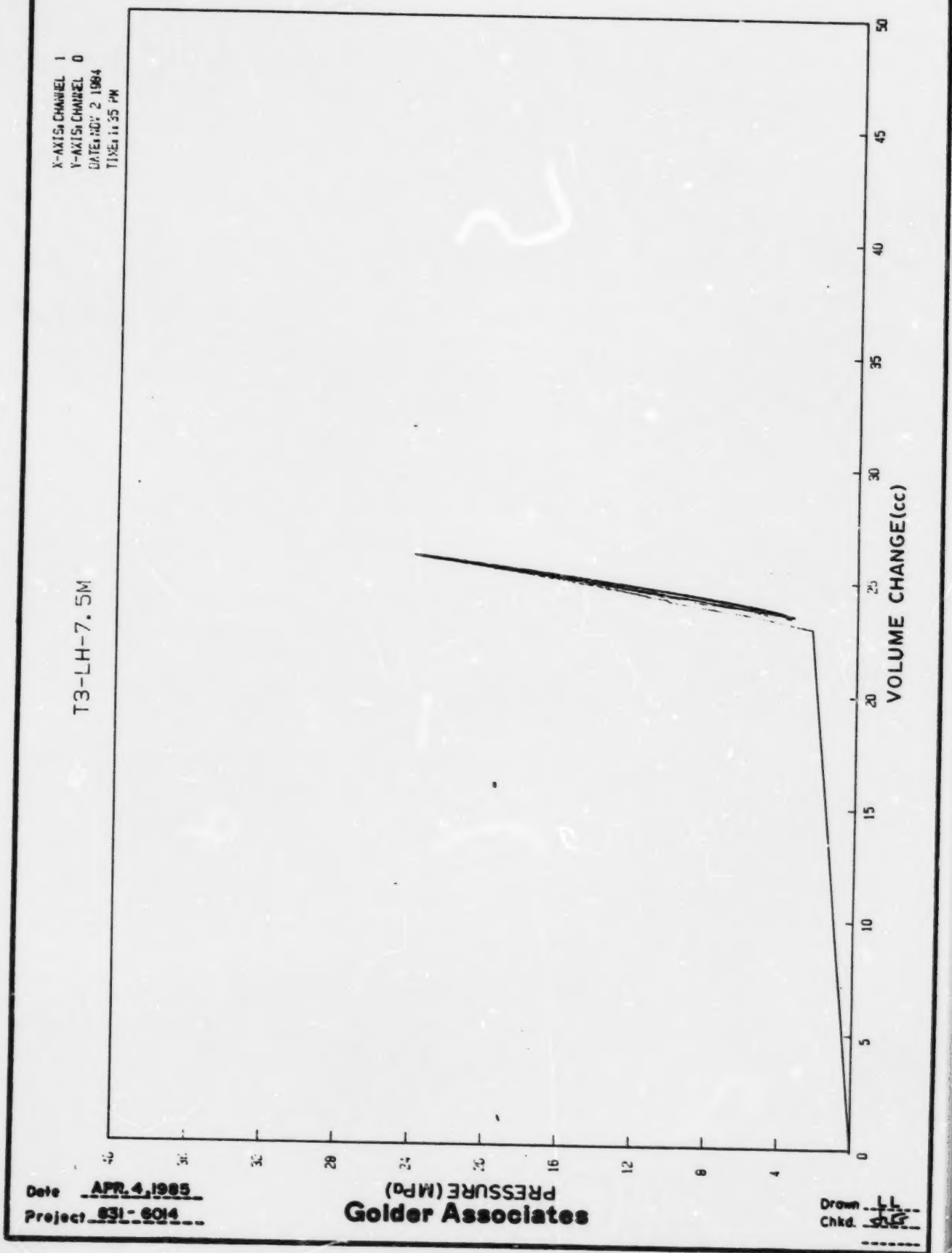
Golder Associates

Drawn

Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-LH-7.5M

FIGURE D.29



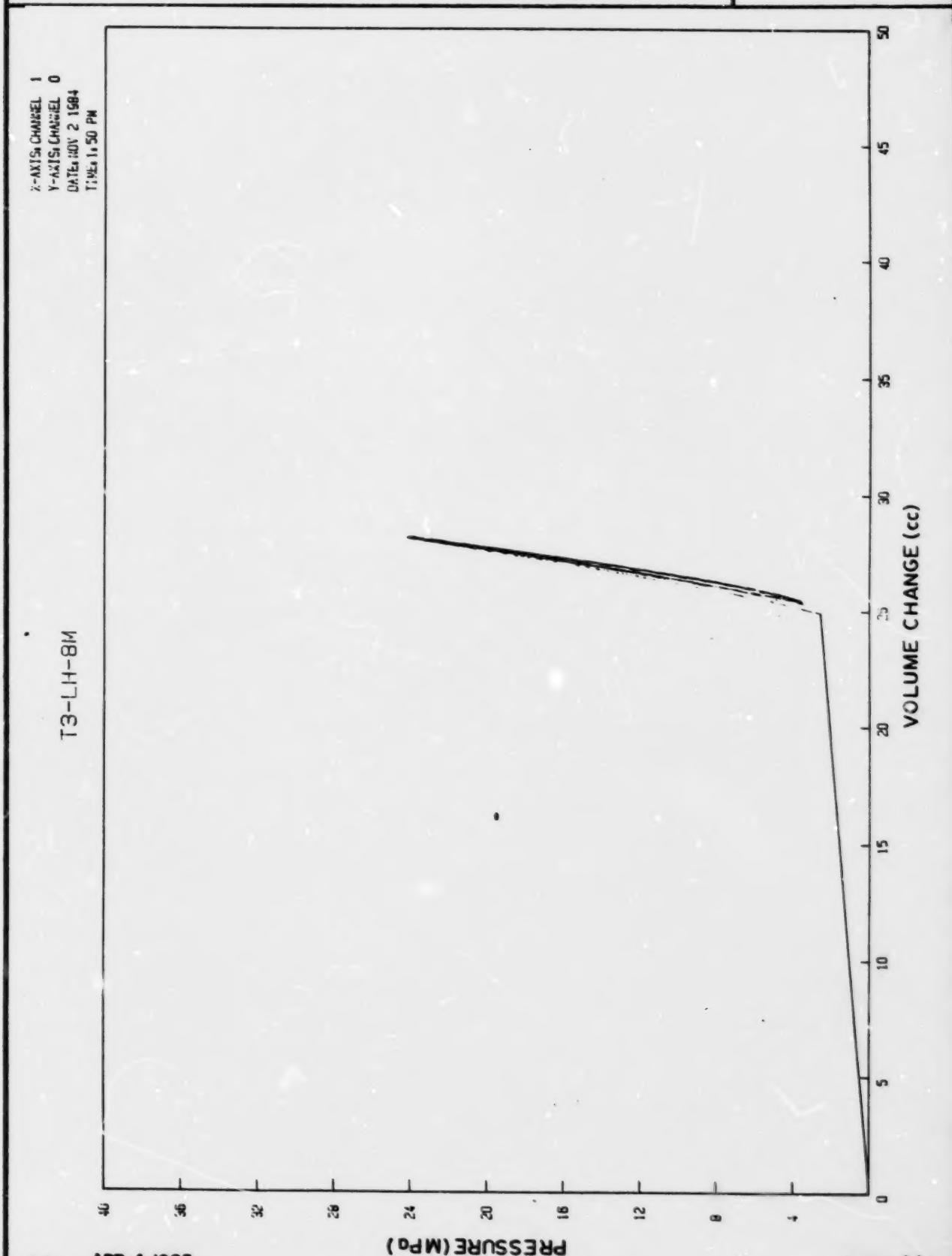
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. SHG

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-LH-8M

FIGURE D.30



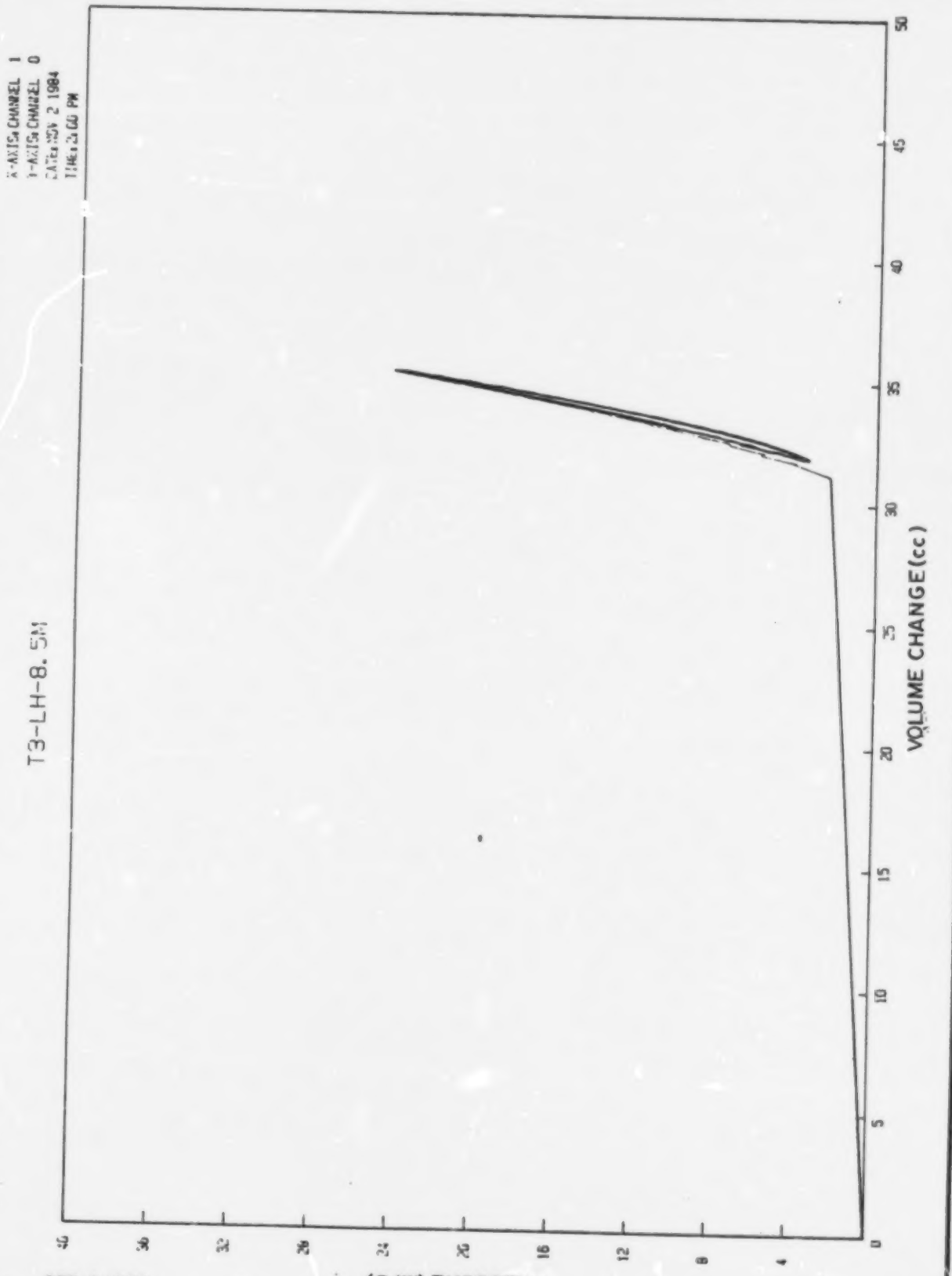
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. JHS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T3-LH-8.5M

FIGURE D.31



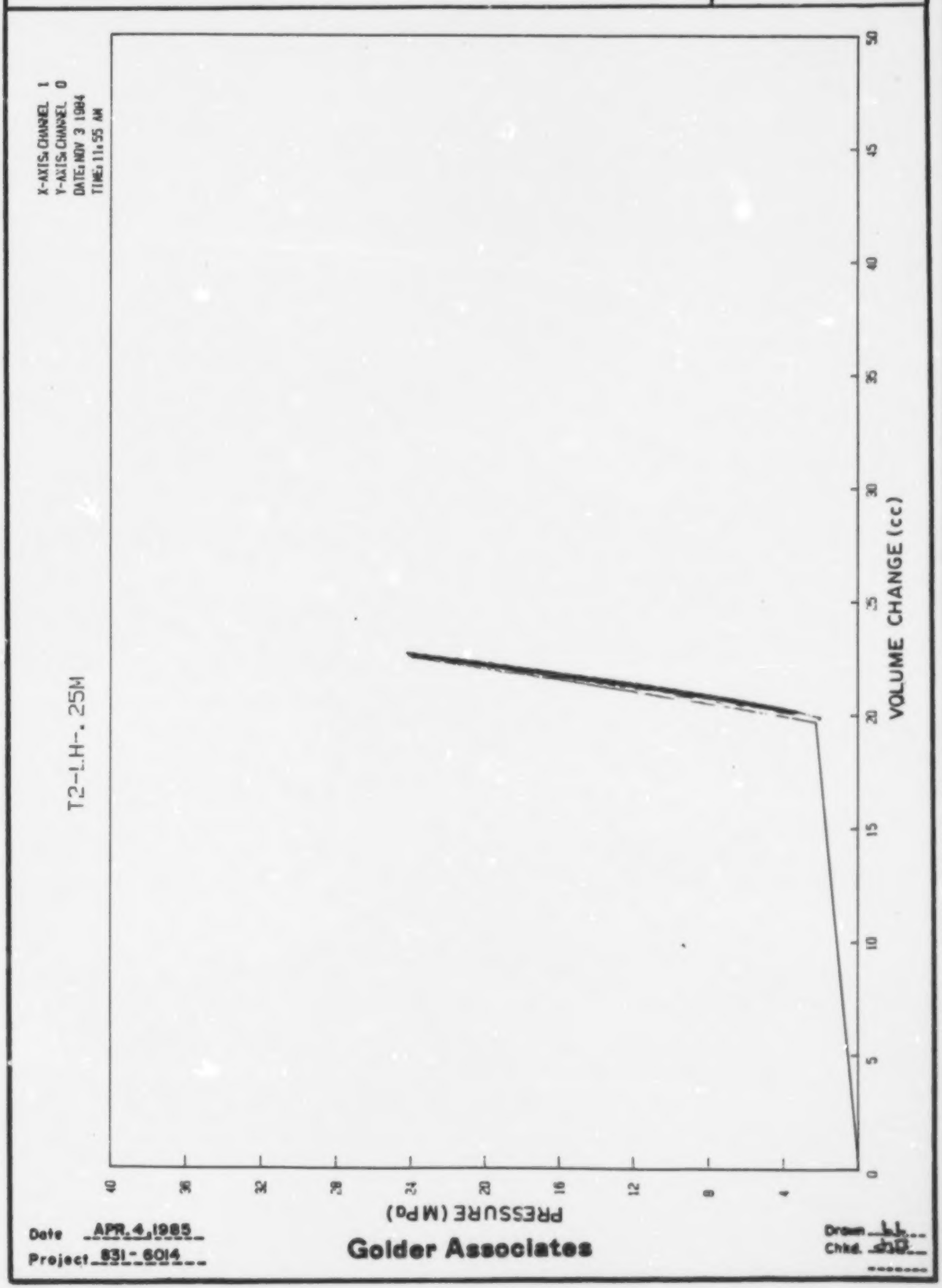
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn LL
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-.25M

FIGURE D.32



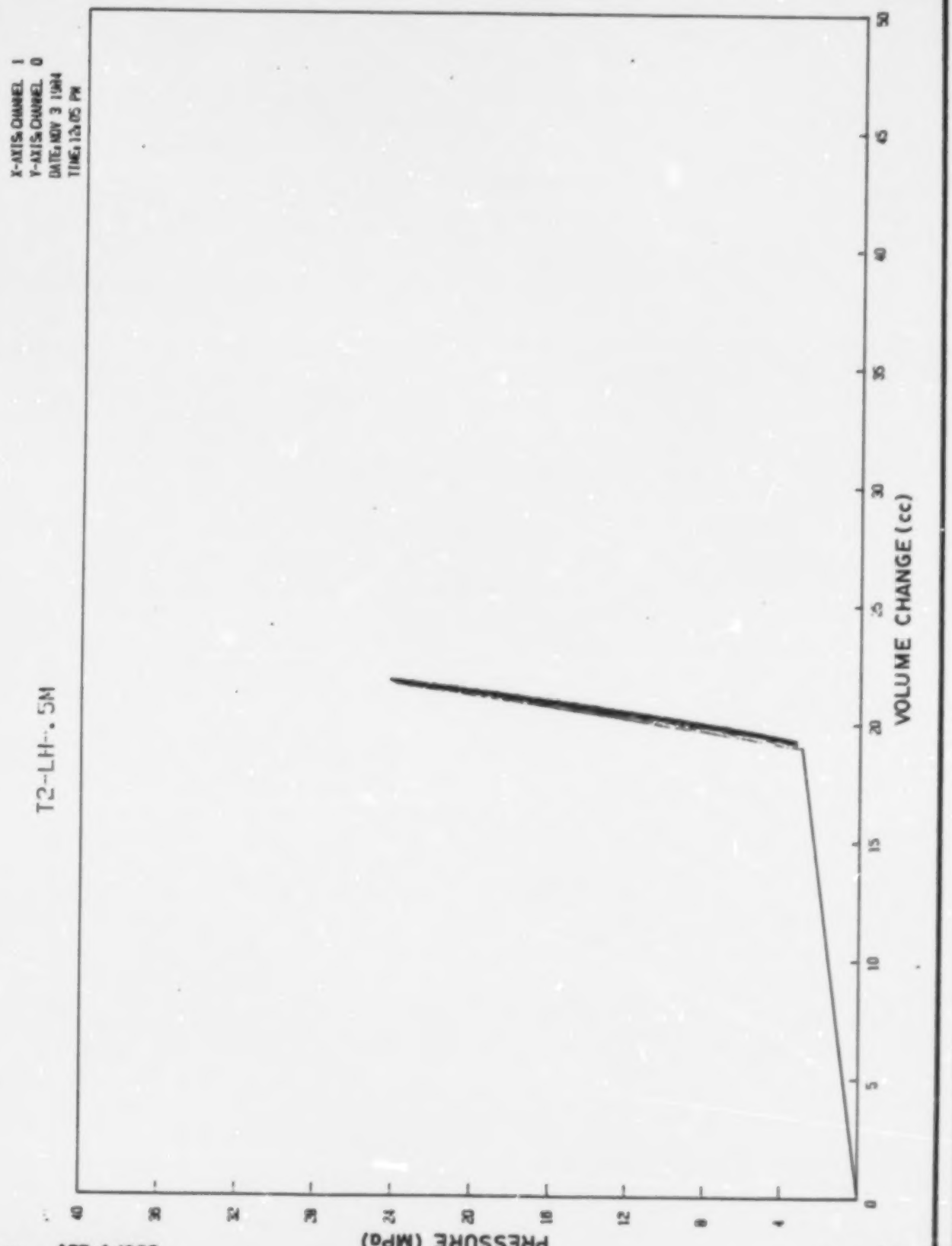
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn bb
Chkd. shb

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-.5M

FIGURE D.33



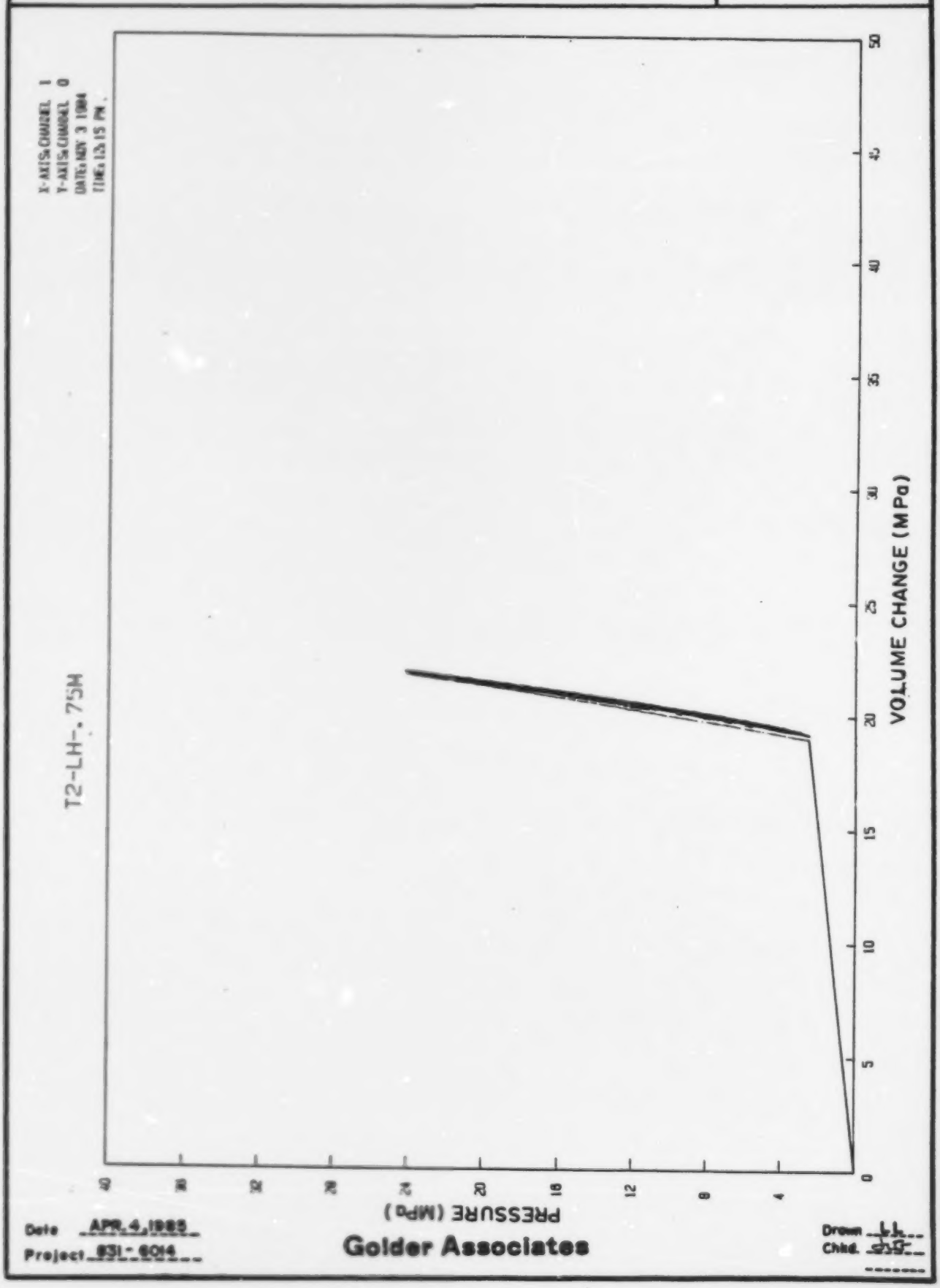
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn LL
Chkd

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-.75M

FIGURE D.34



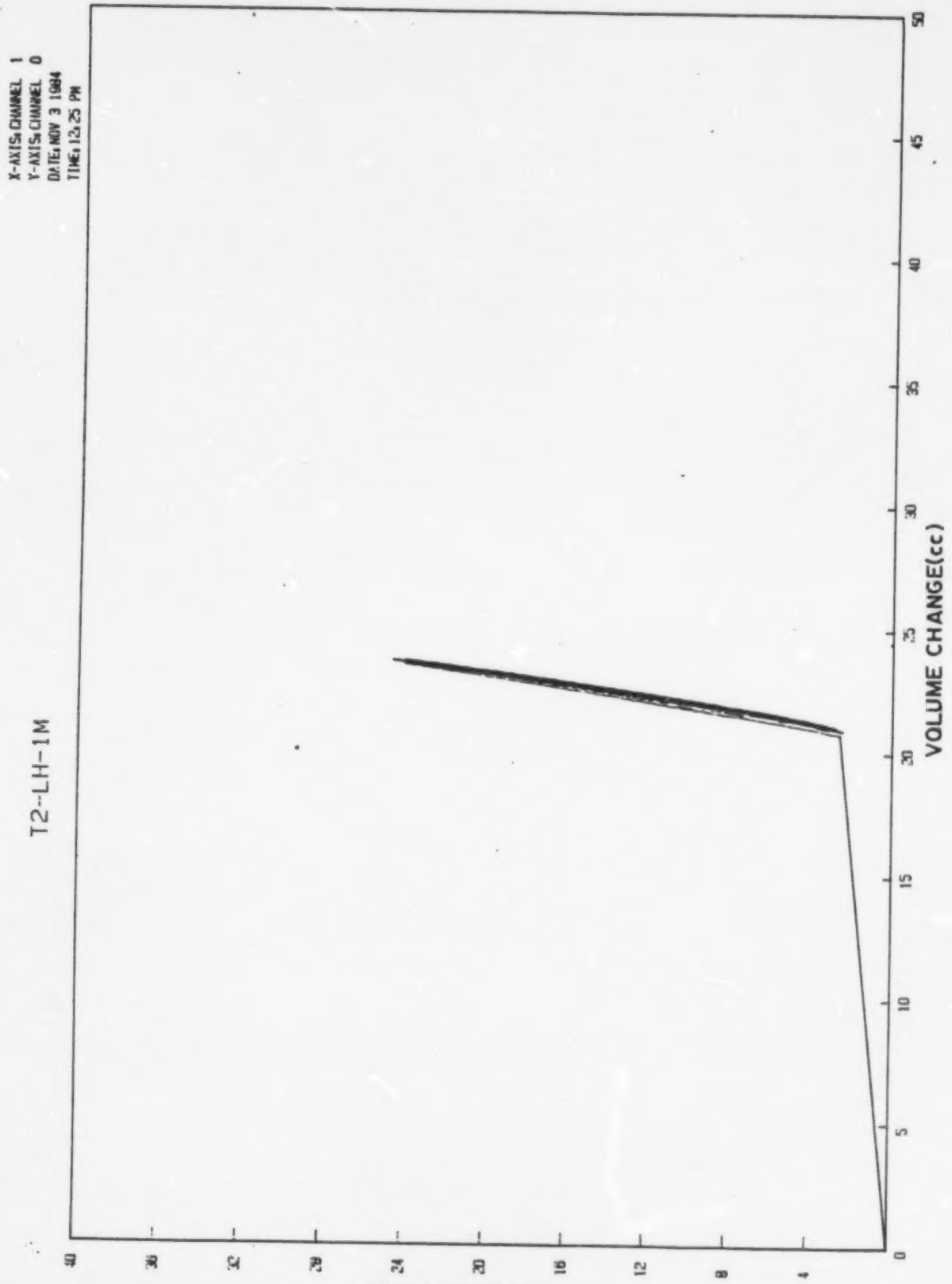
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. [illegible]

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-1M

FIGURE D.35



Date APR.4,1985

Project 851-6014

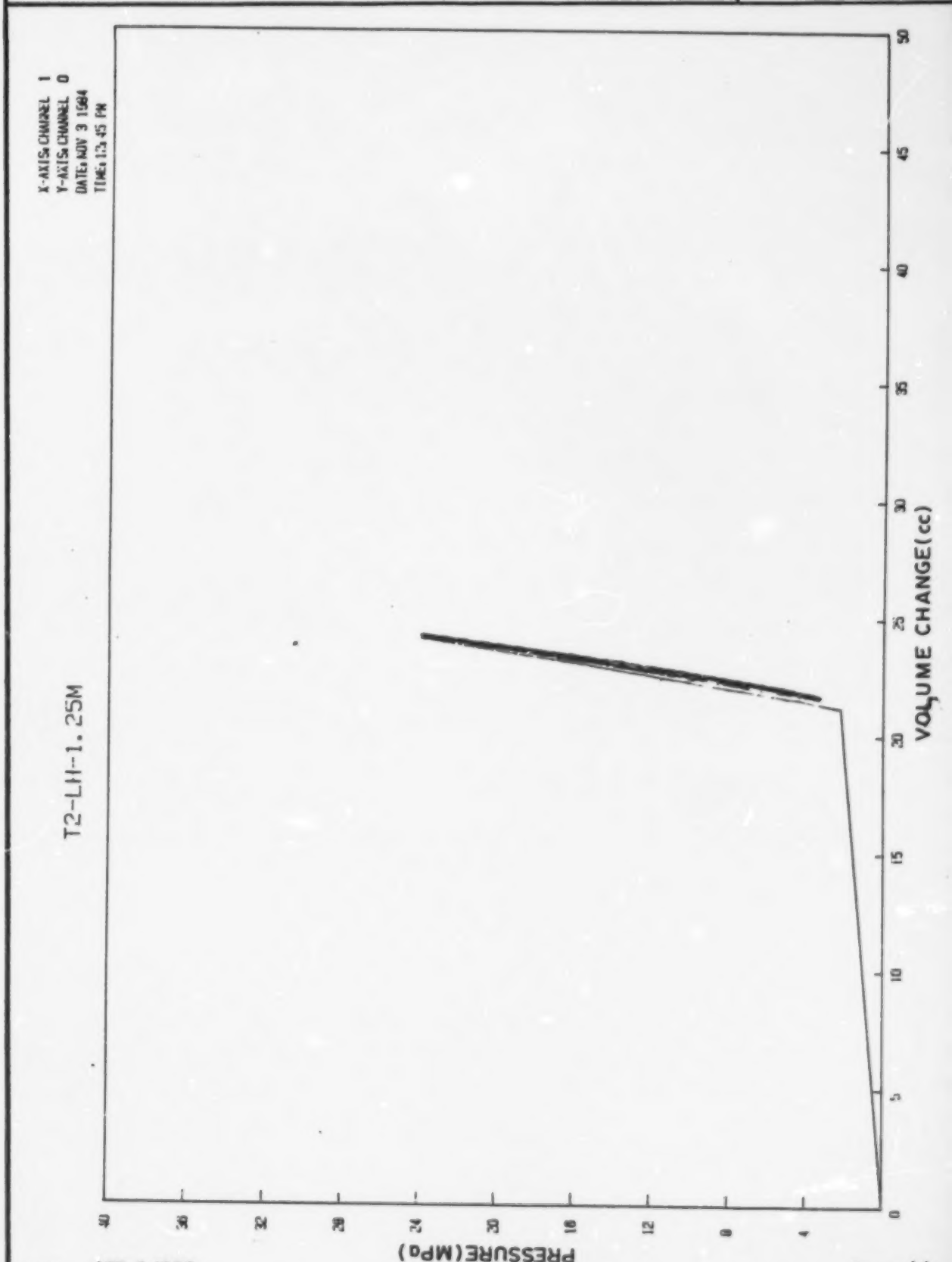
Golder Associates

Drawn LH

Chkd. CHK

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-1.25M

FIGURE D.36



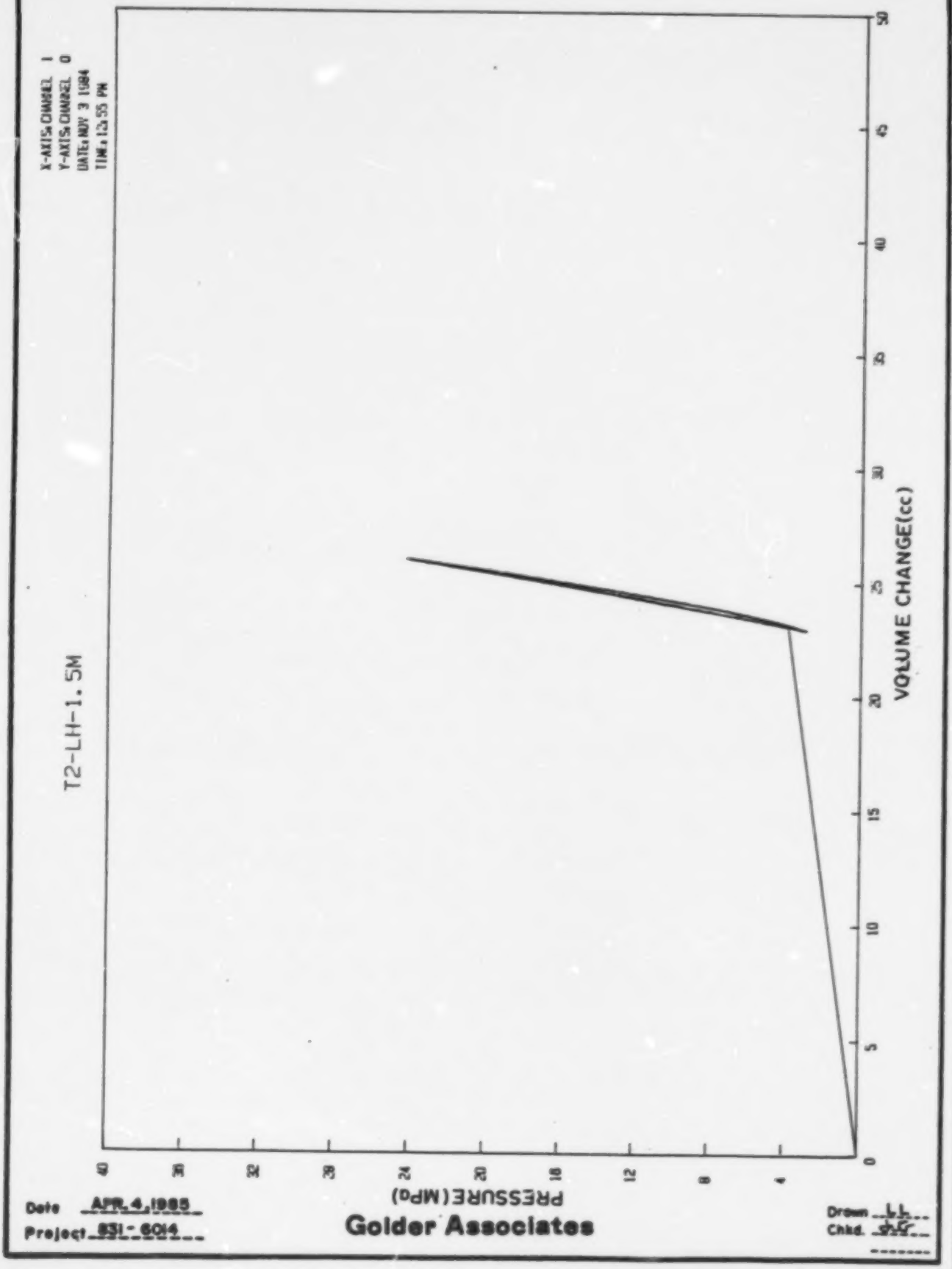
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-1.5M

FIGURE D.37



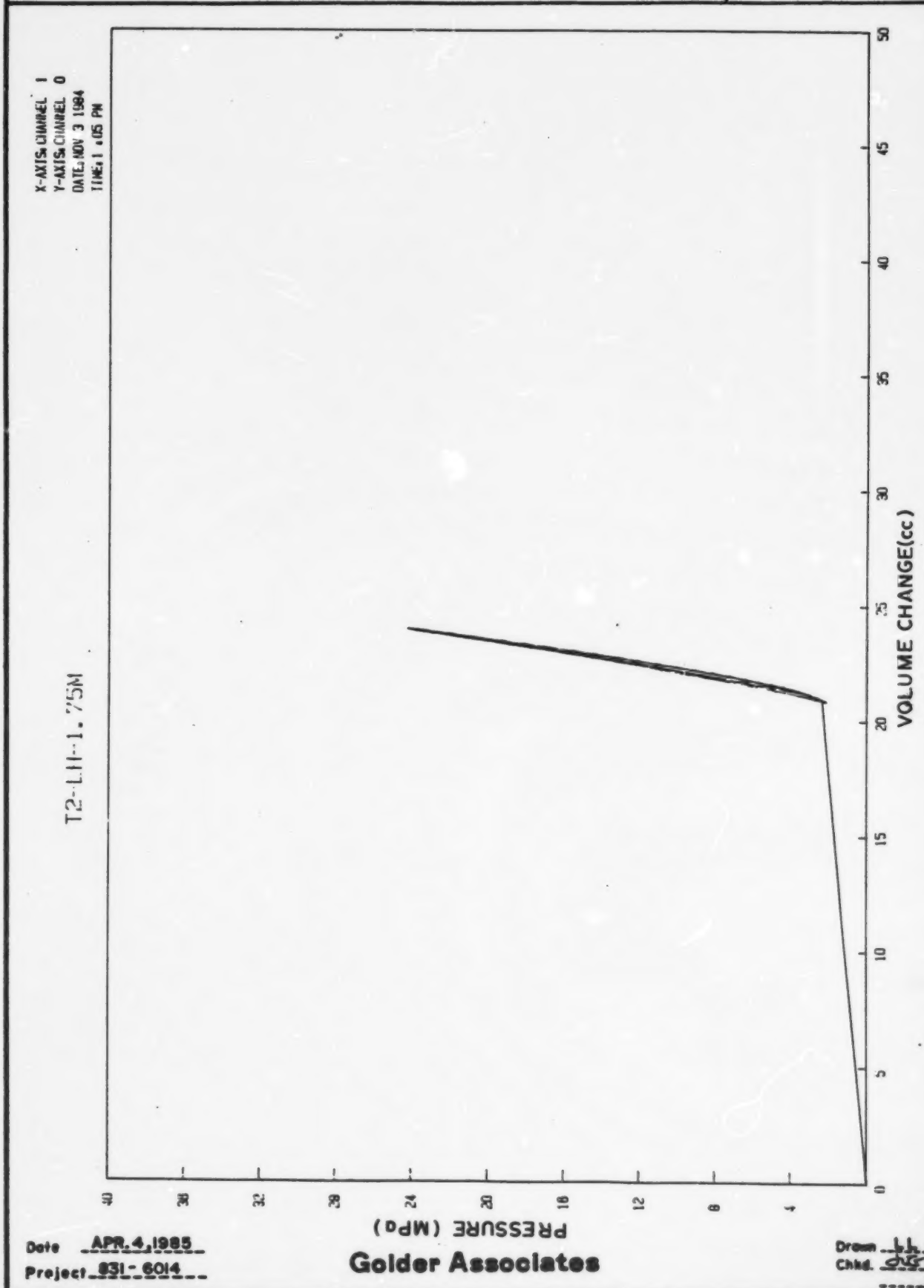
Date APR. 4, 1985
Project 851-6014

Golder Associates

Drawn LL
Chkd. SHS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-1.75M

FIGURE D.38



Date APR. 4, 1985

Project 831-6014

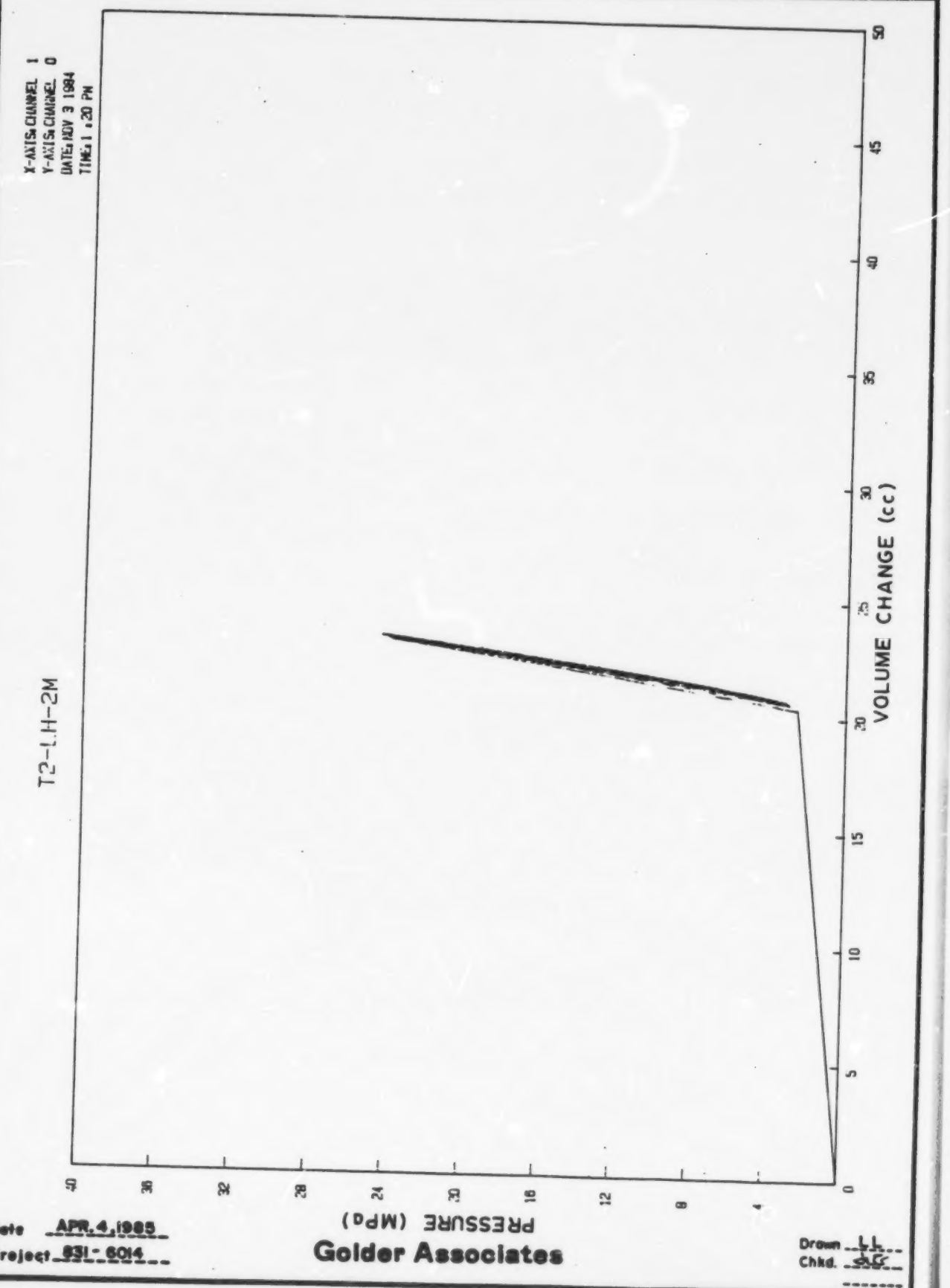
Golder Associates

Drawn

Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-2M

FIGURE D.39



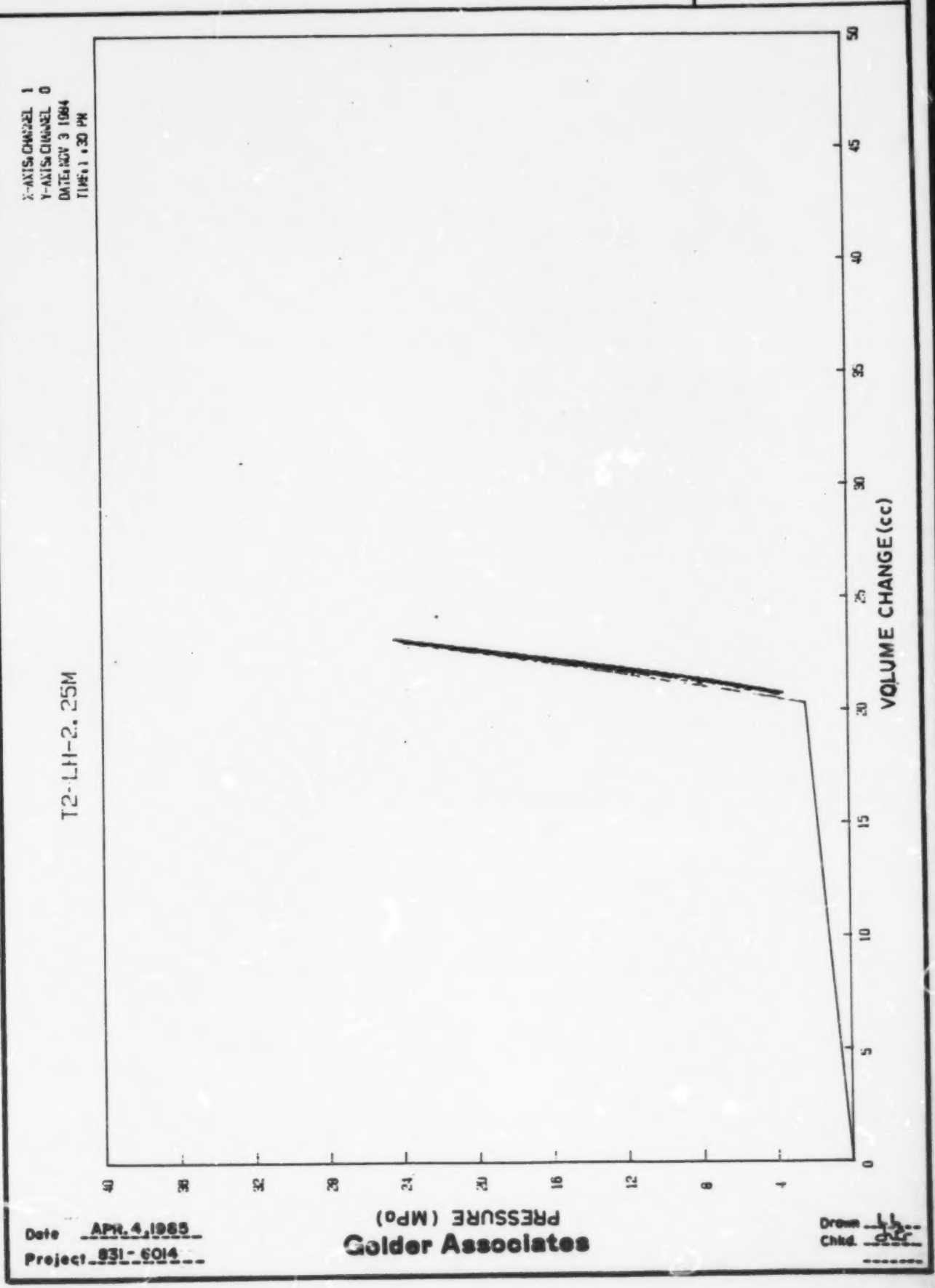
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. SC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-2.25M

FIGURE D.40



Date APR. 4, 1985

Project 831-6014

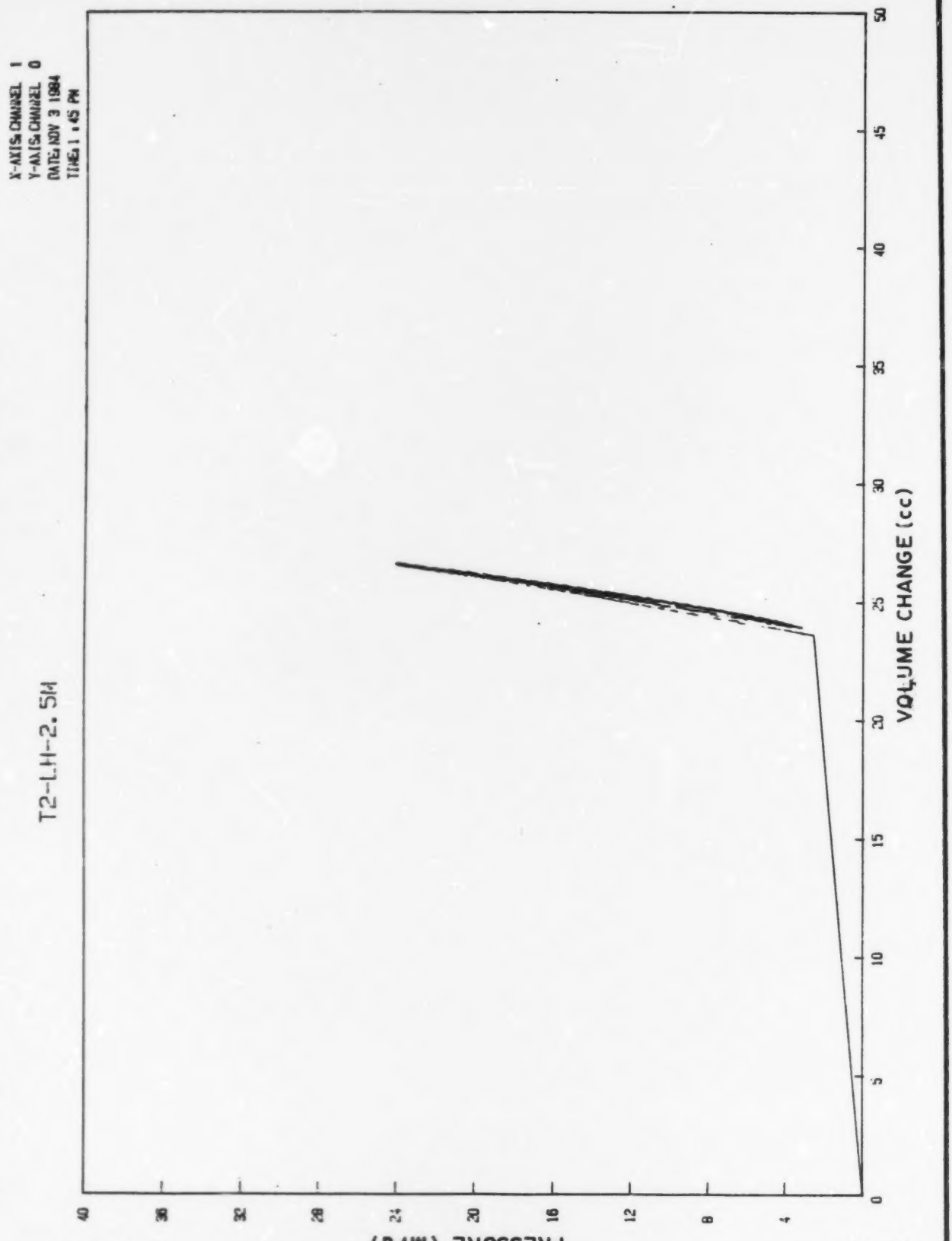
Golder Associates

Drawn LL

Chkd. GKF

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-2.5M

FIGURE D.41



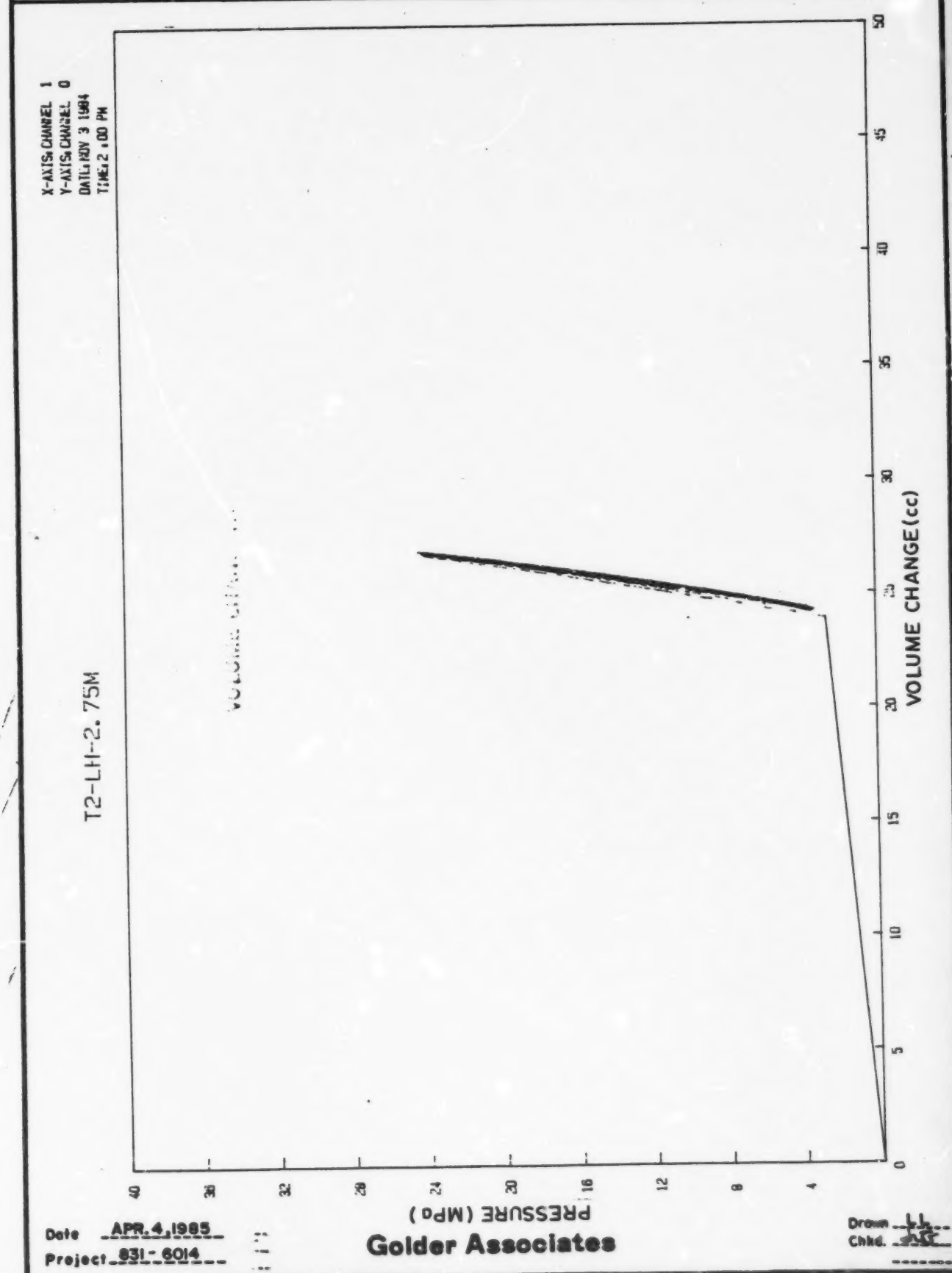
Date APR.4,1985
Project 851-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-2.75M

FIGURE D.42



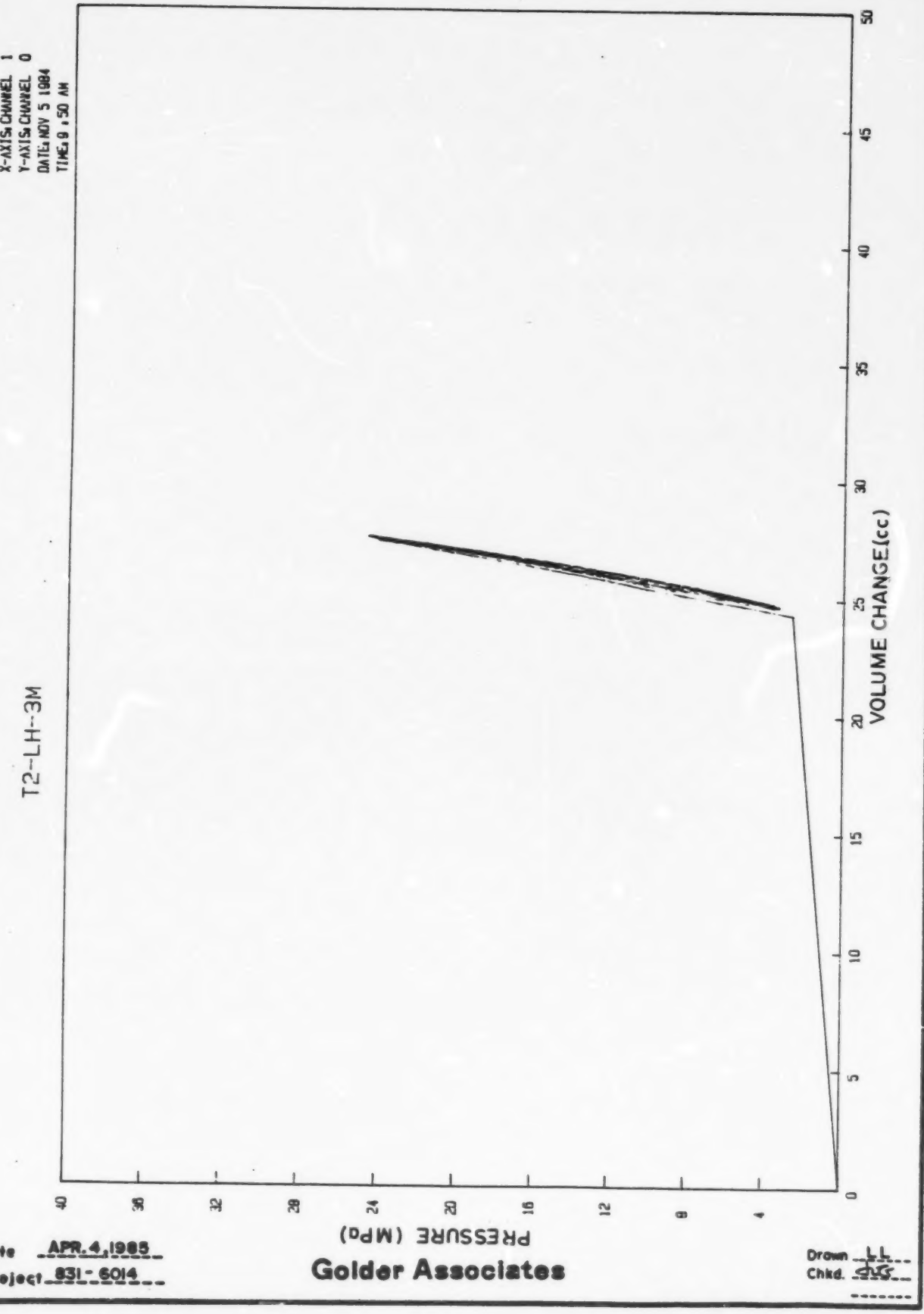
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-3M

FIGURE D.43



Date APR.4,1985

Project 831-6014

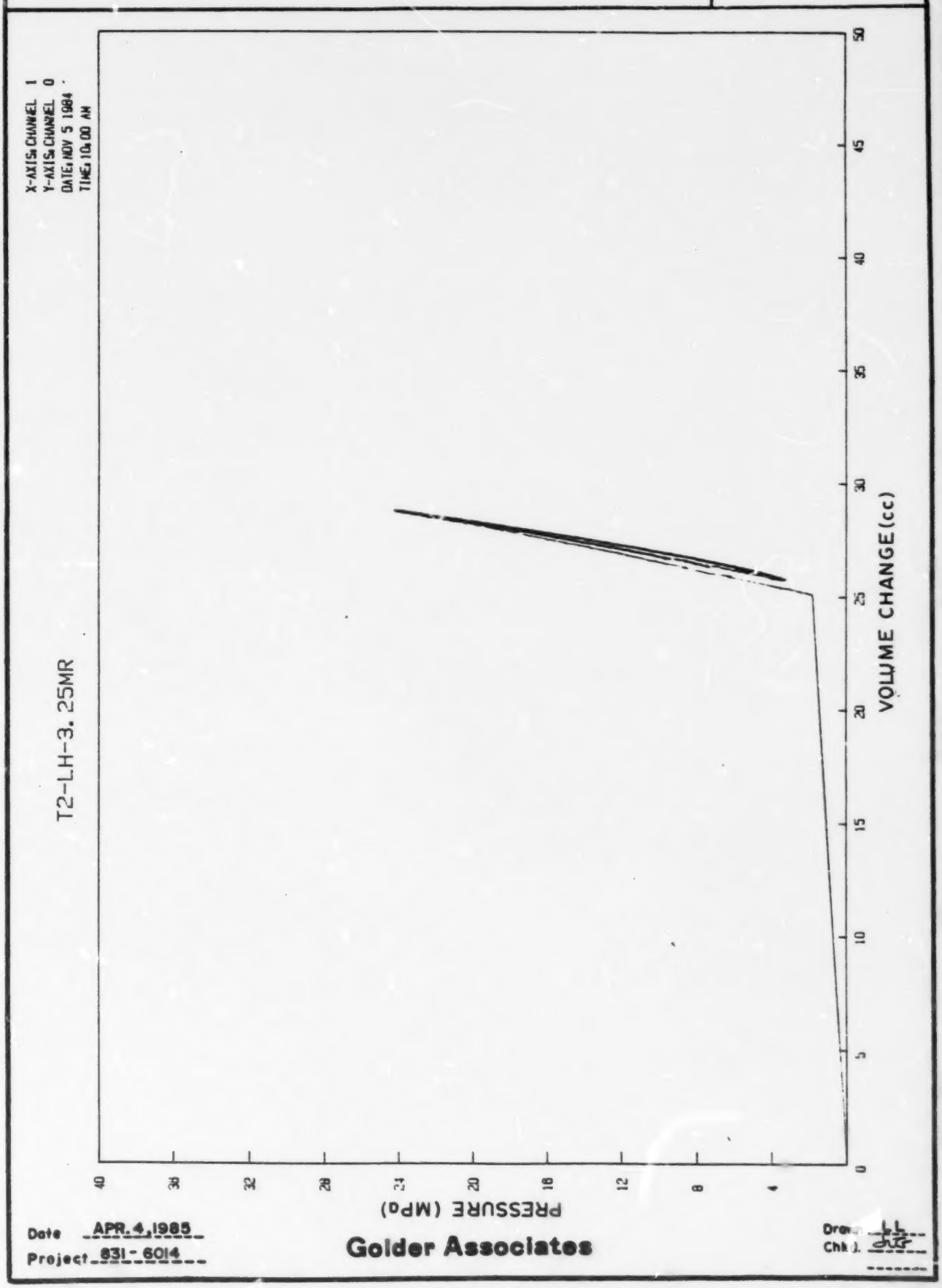
Golder Associates

Drawn LL

Chkd. SKS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-3.25M

FIGURE D.44



Date APR. 4, 1985

Project 831-6014

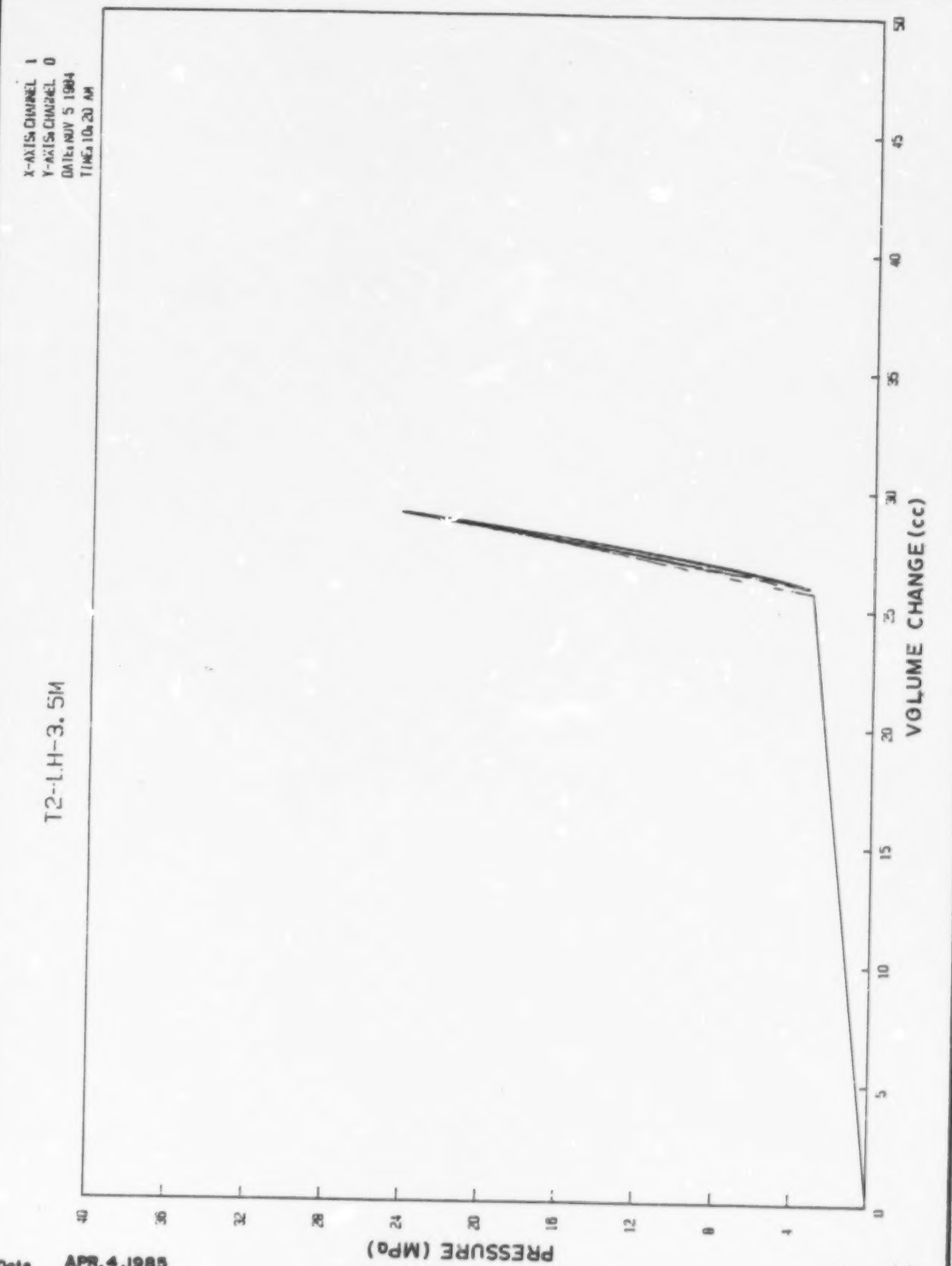
Golder Associates

Drawn

Chkd

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-3.5M

FIGURE D.45



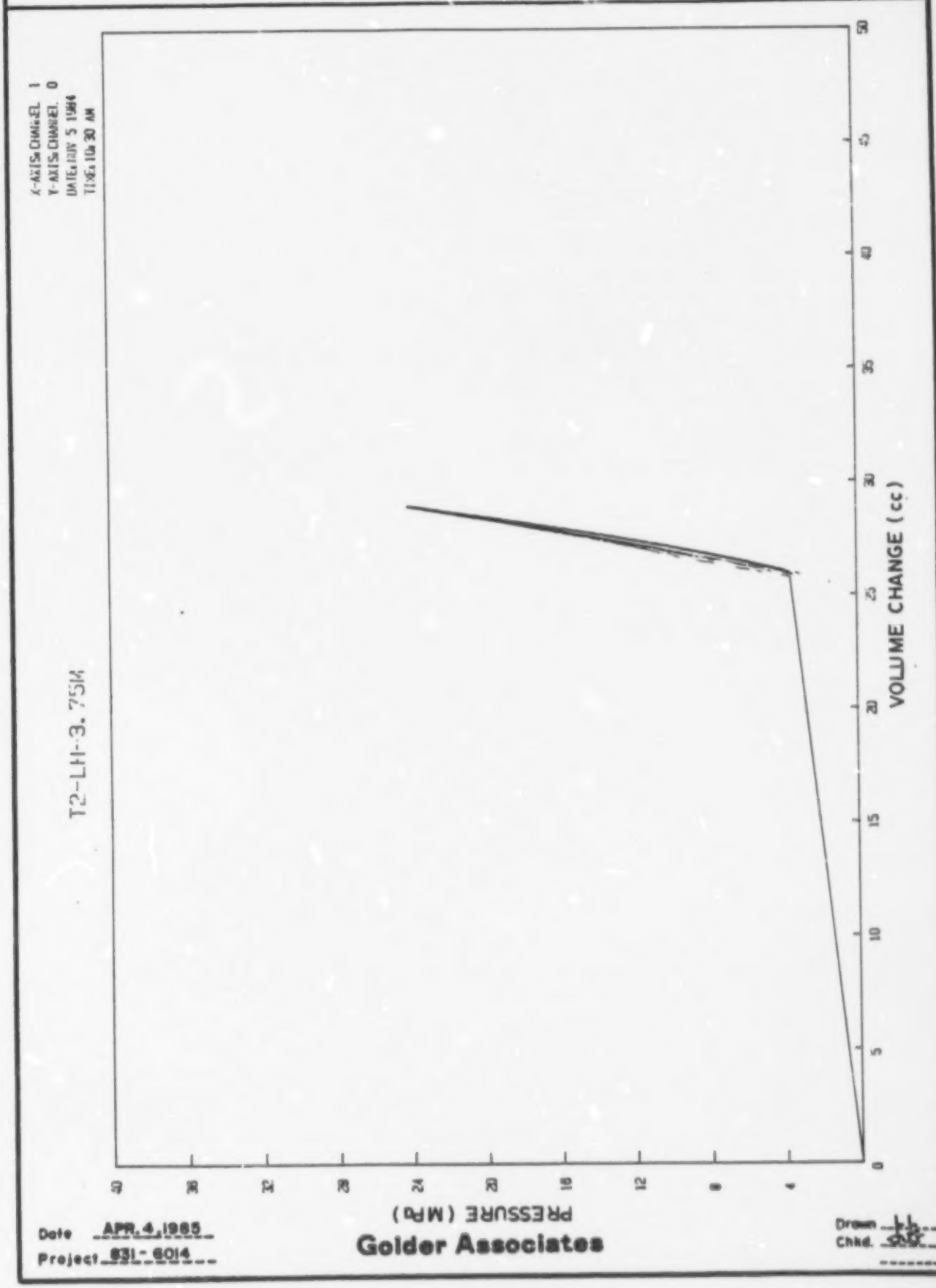
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. DJS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-3.75M

FIGURE D.46



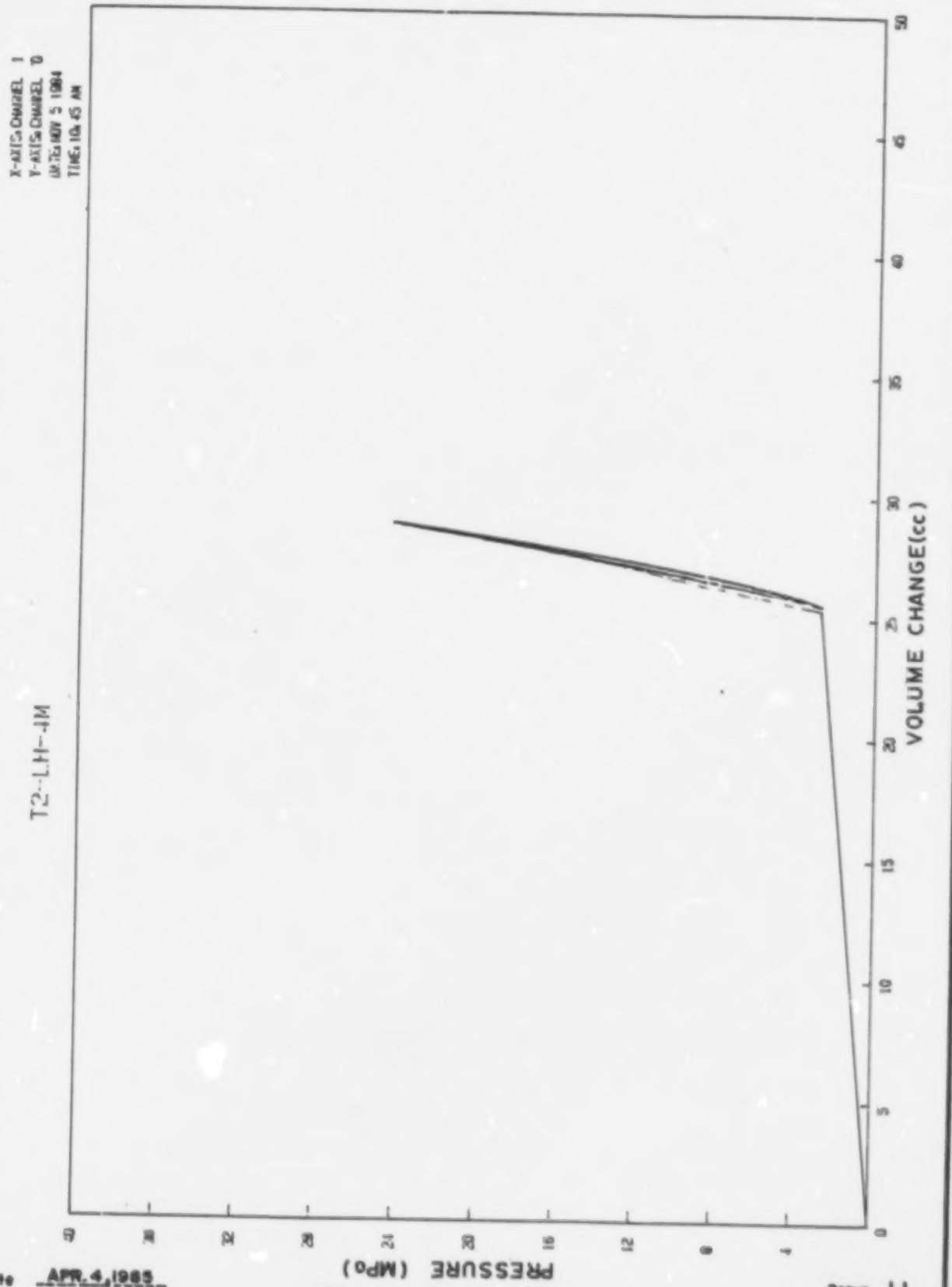
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-4M

FIGURE D.47



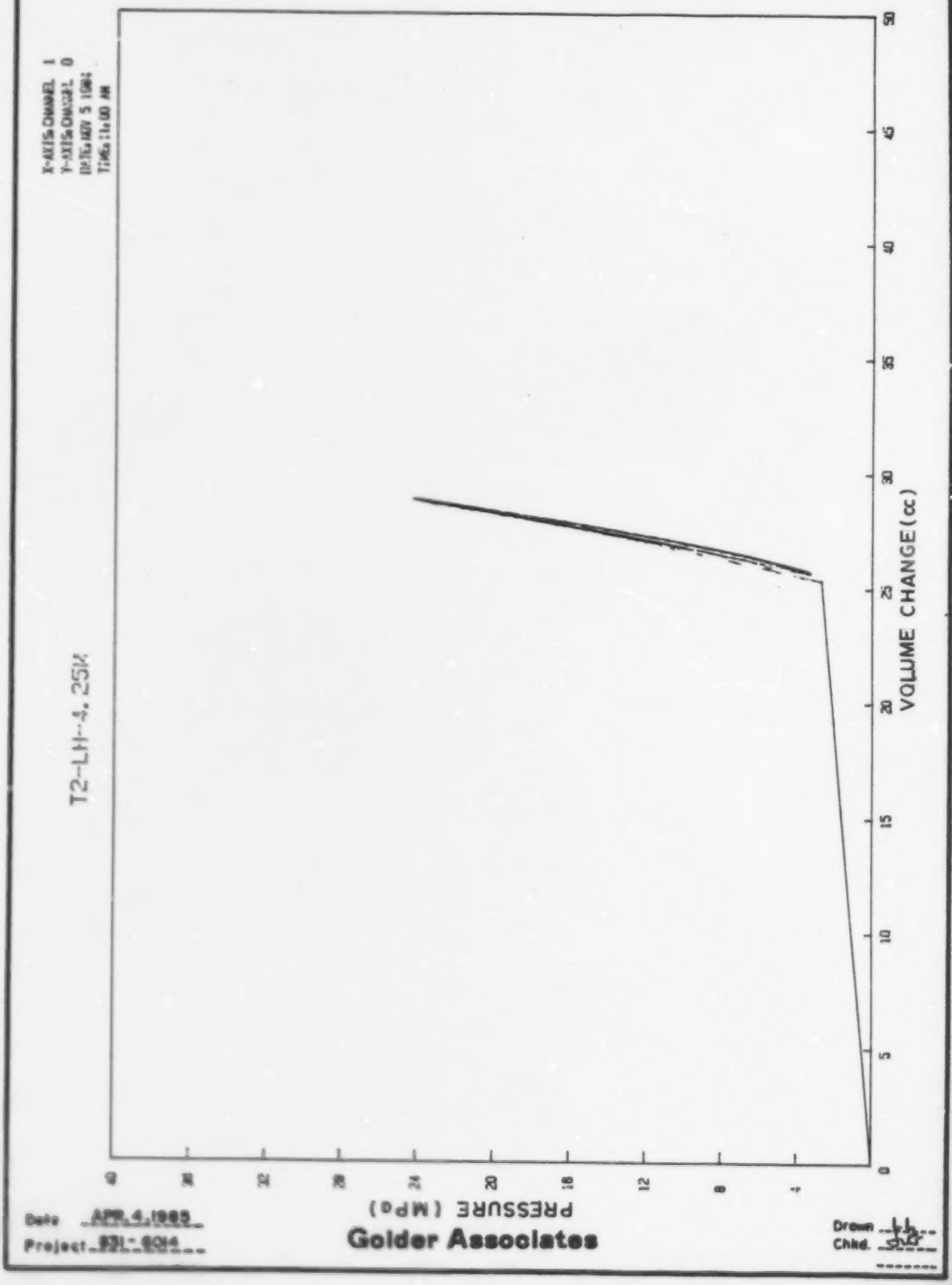
Date APR.4,1985
Project 931-5014

Golder Associates

Drawn LL
Chkd SSD

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO.T2-LH-4.25M

FIGURE D.48



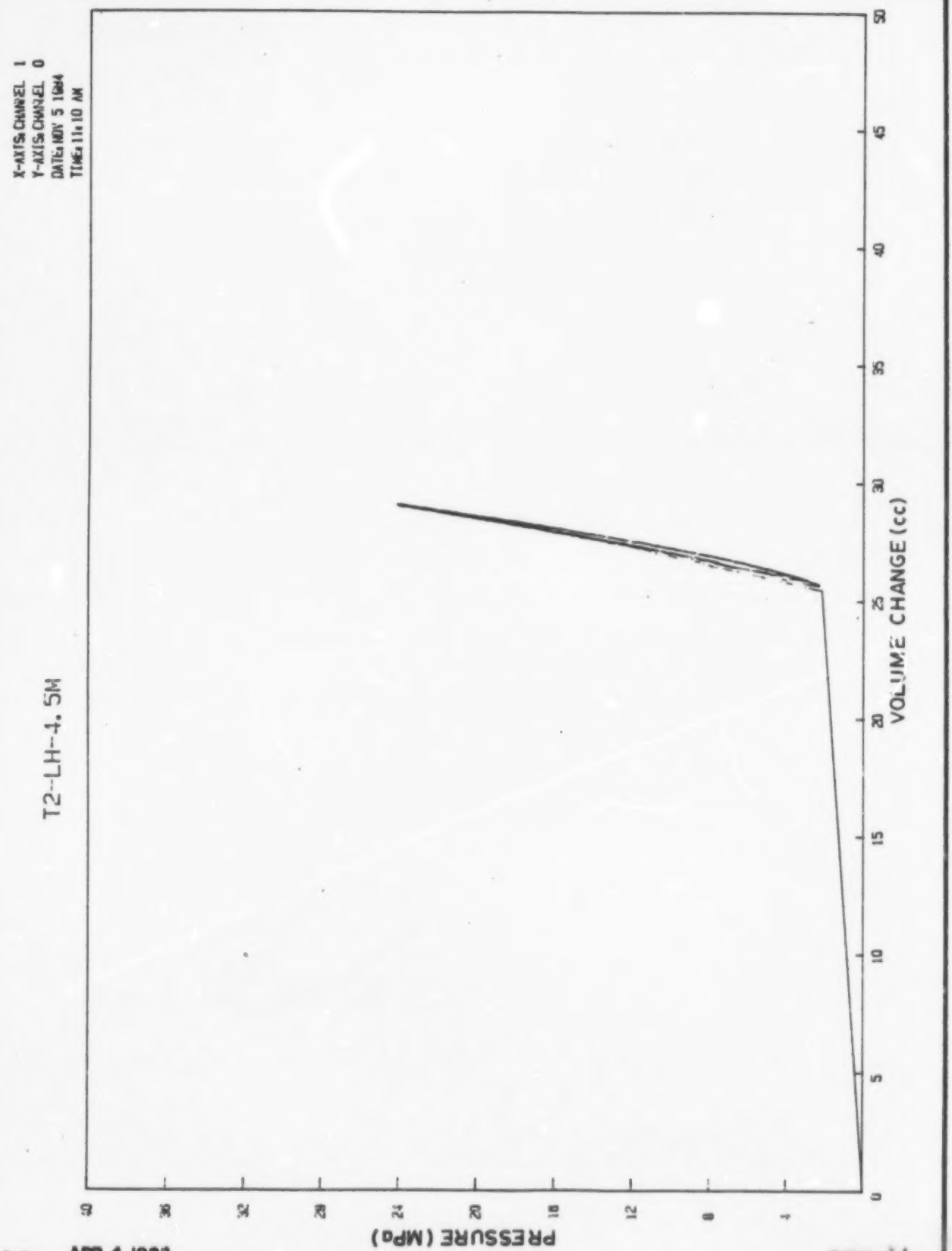
Date APR.4,1989
Project 831-6014

Golder Associates

Drawn LL
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-4.5M

FIGURE D.49



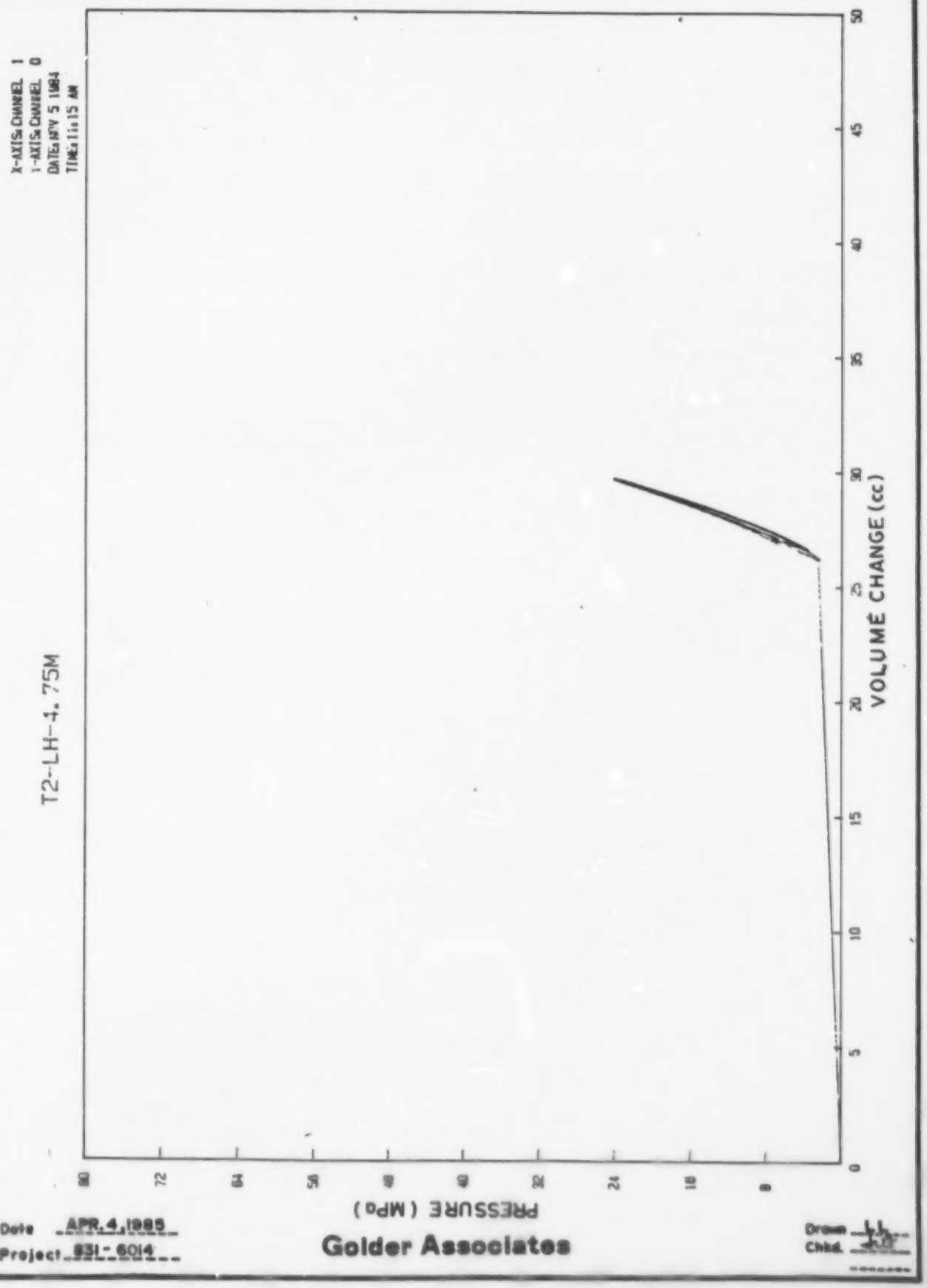
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn LH
Chkd. GHC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-4.75M

FIGURE D.50



Date APR.4.1985

Project 831-6014

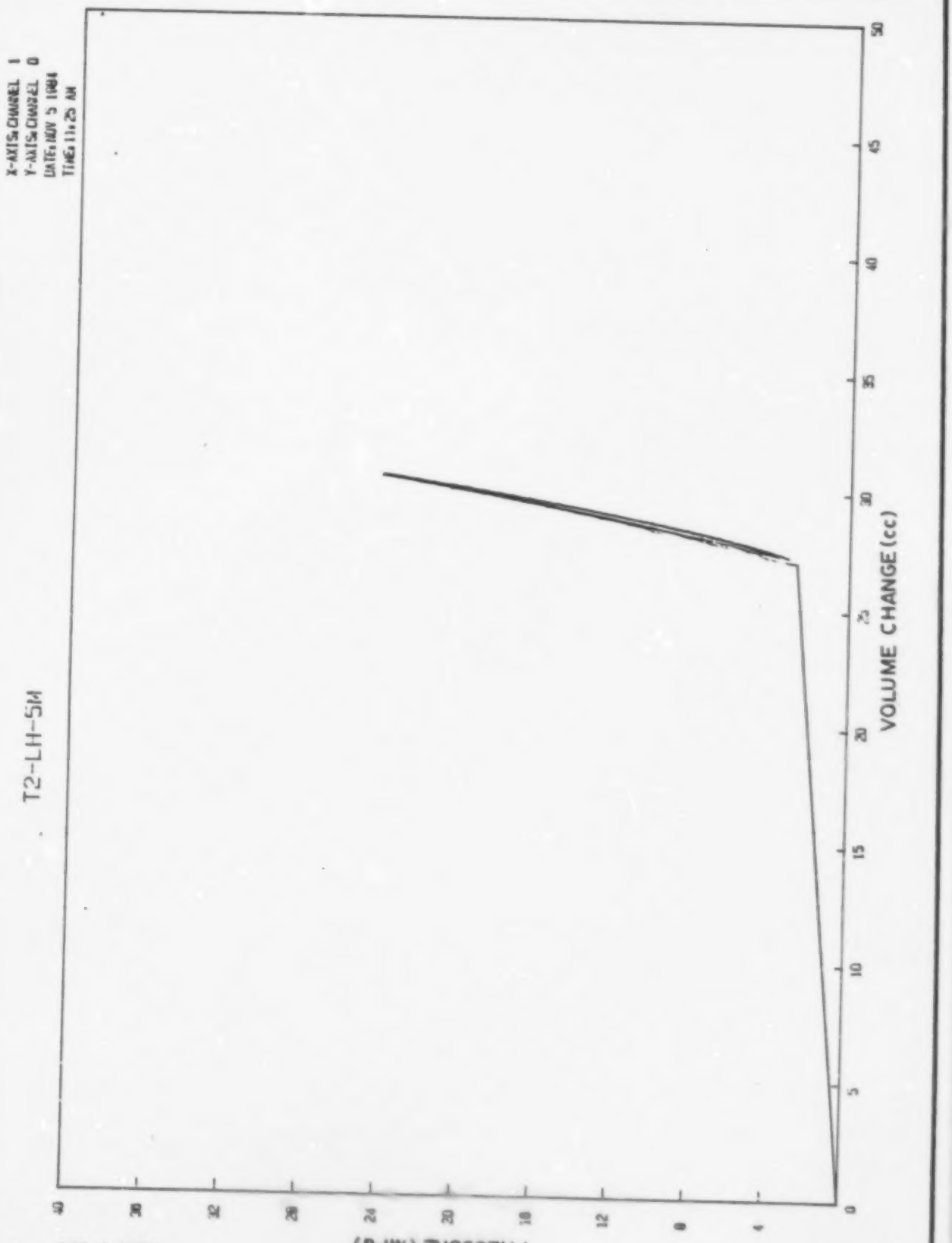
Golder Associates

Drawn

Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-5M

FIGURE D.51



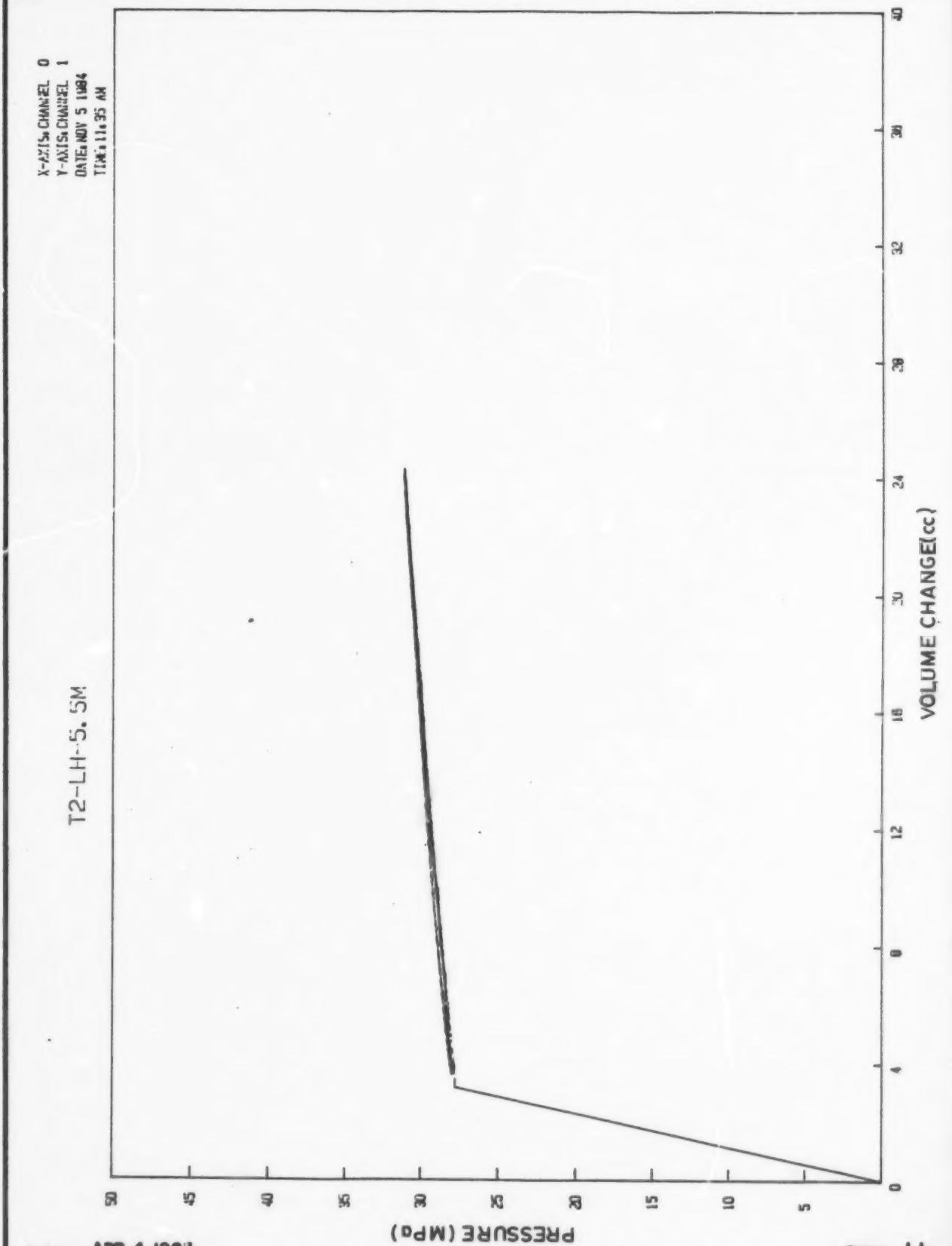
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. SAP

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-5.5M

FIGURE D.52



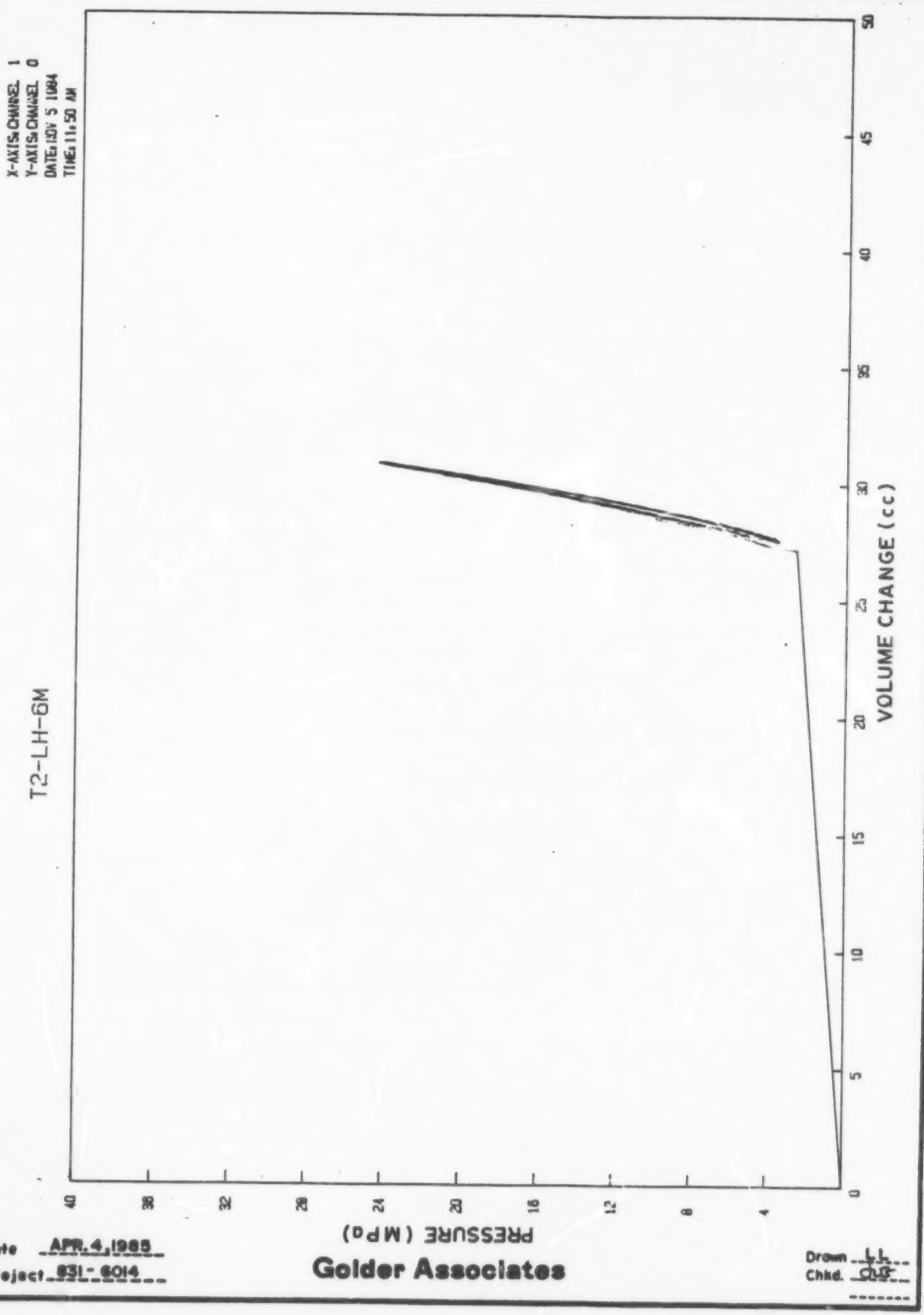
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. JHC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-6M

FIGURE D-53



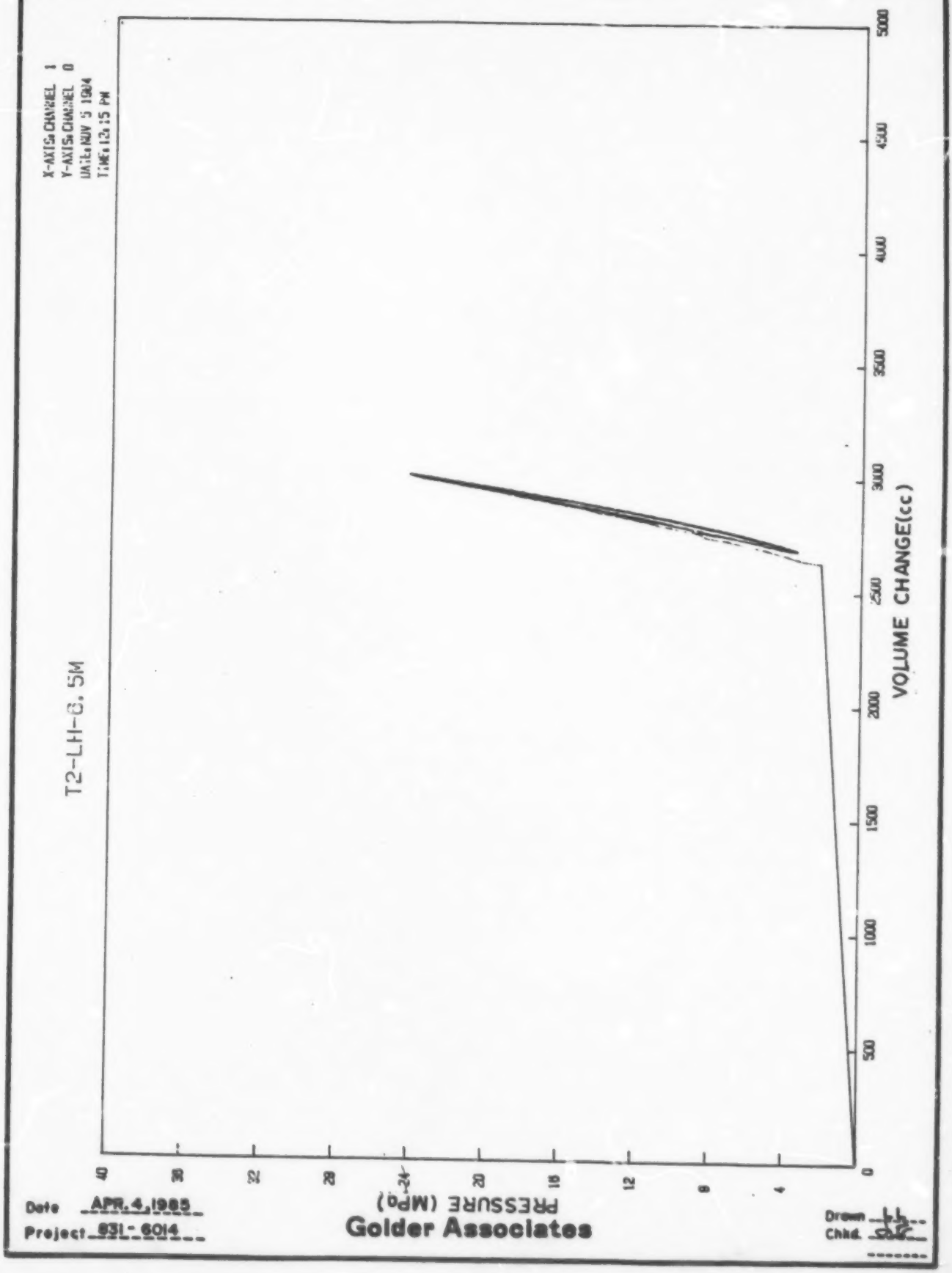
Date APR.4,1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. CWF

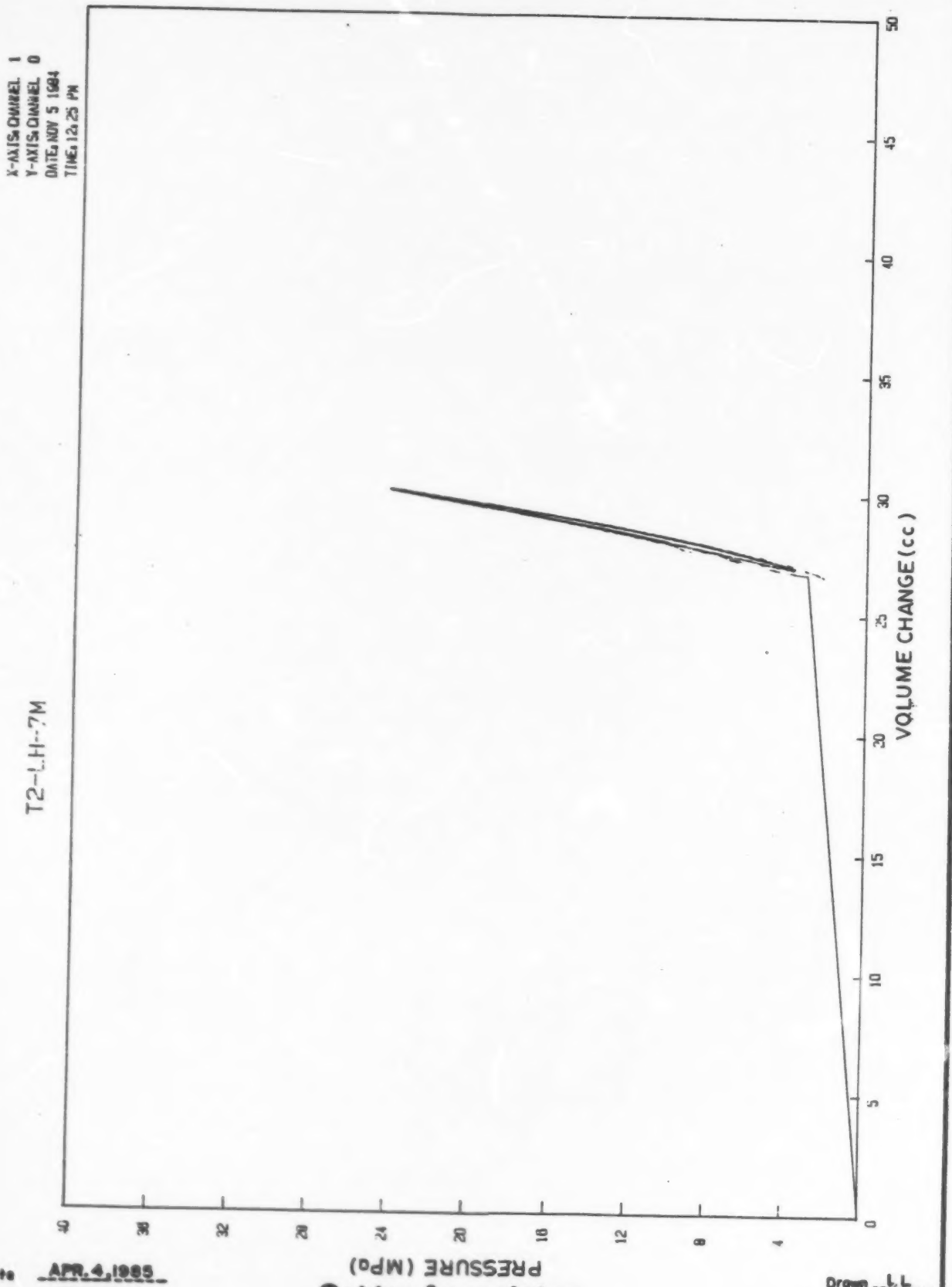
RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-6.5M

FIGURE D.54



RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-7M

FIGURE D.55



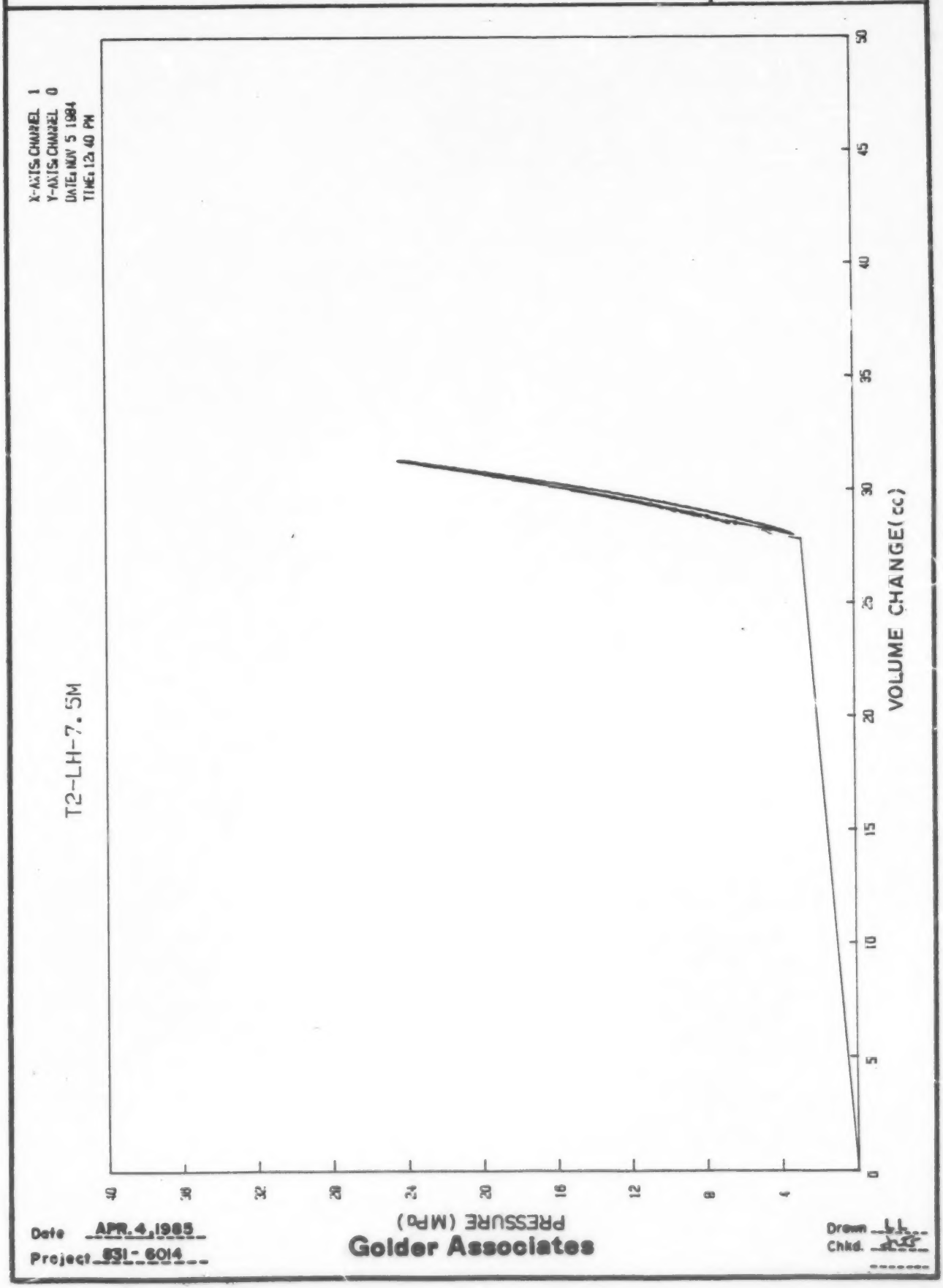
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-7.5M

FIGURE D.56



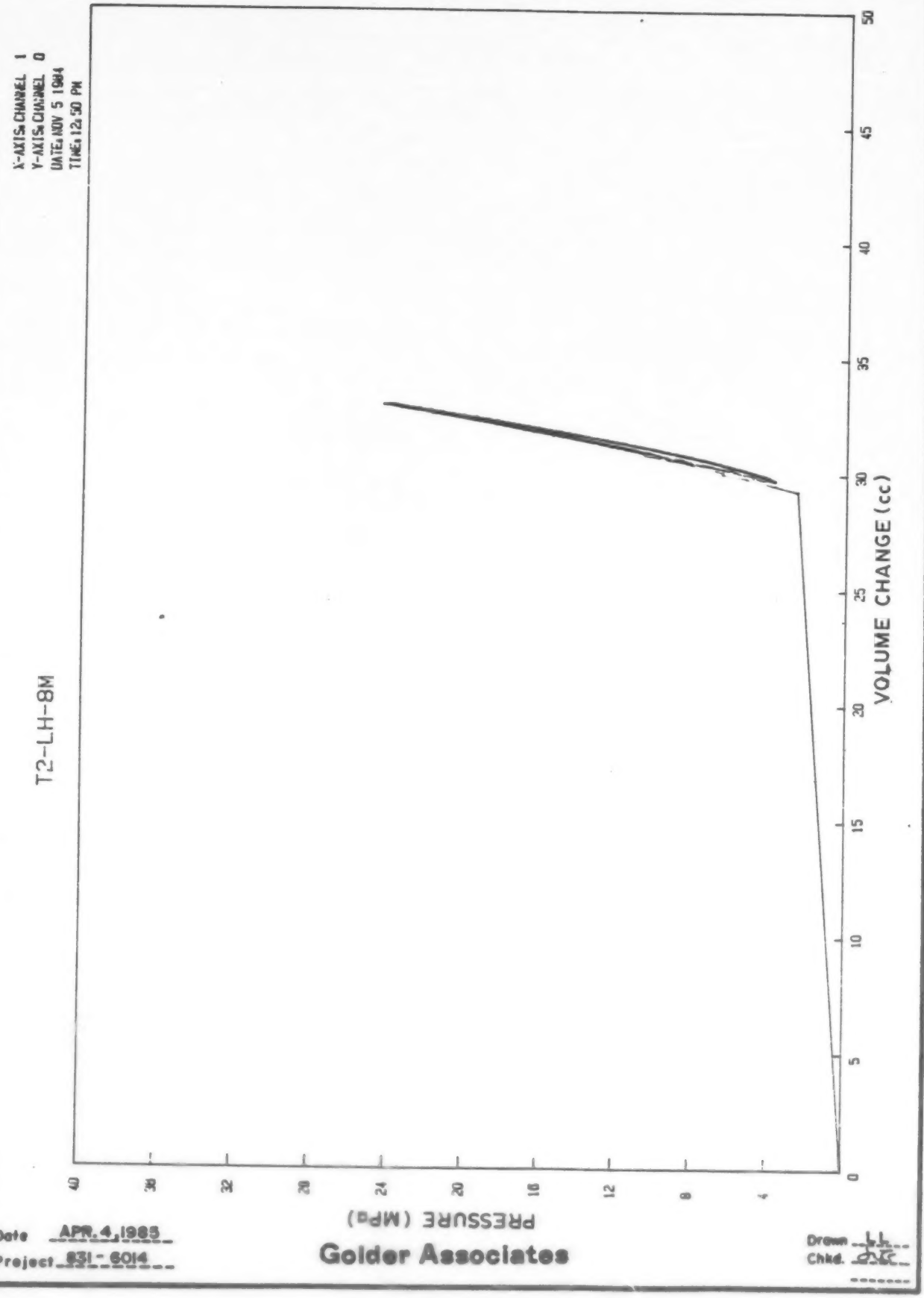
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. JKS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-8M

FIGURE D.57



Date APR. 4, 1985

Project 831-6014

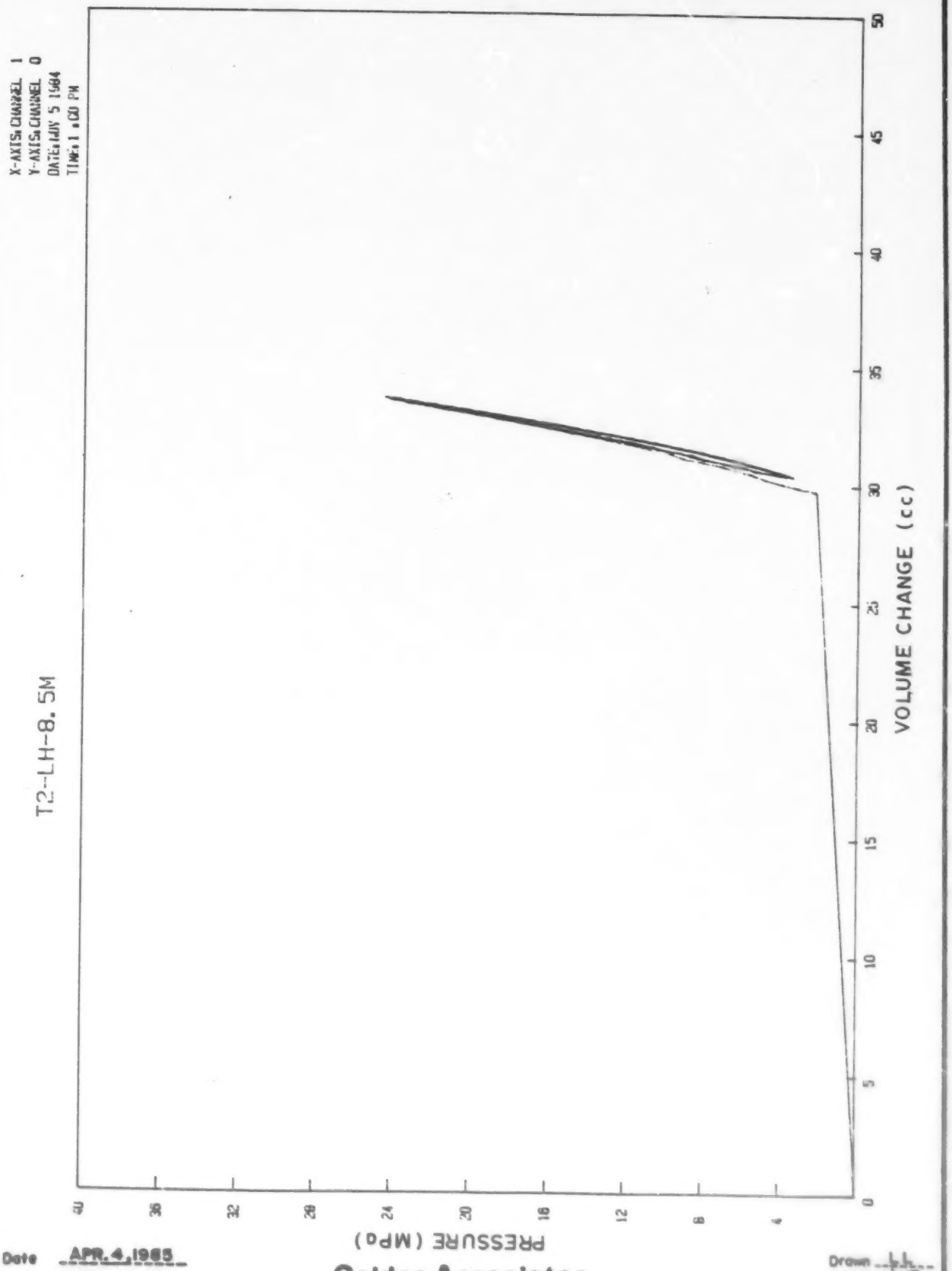
Golder Associates

Drawn

Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-8.5M

FIGURE D.58



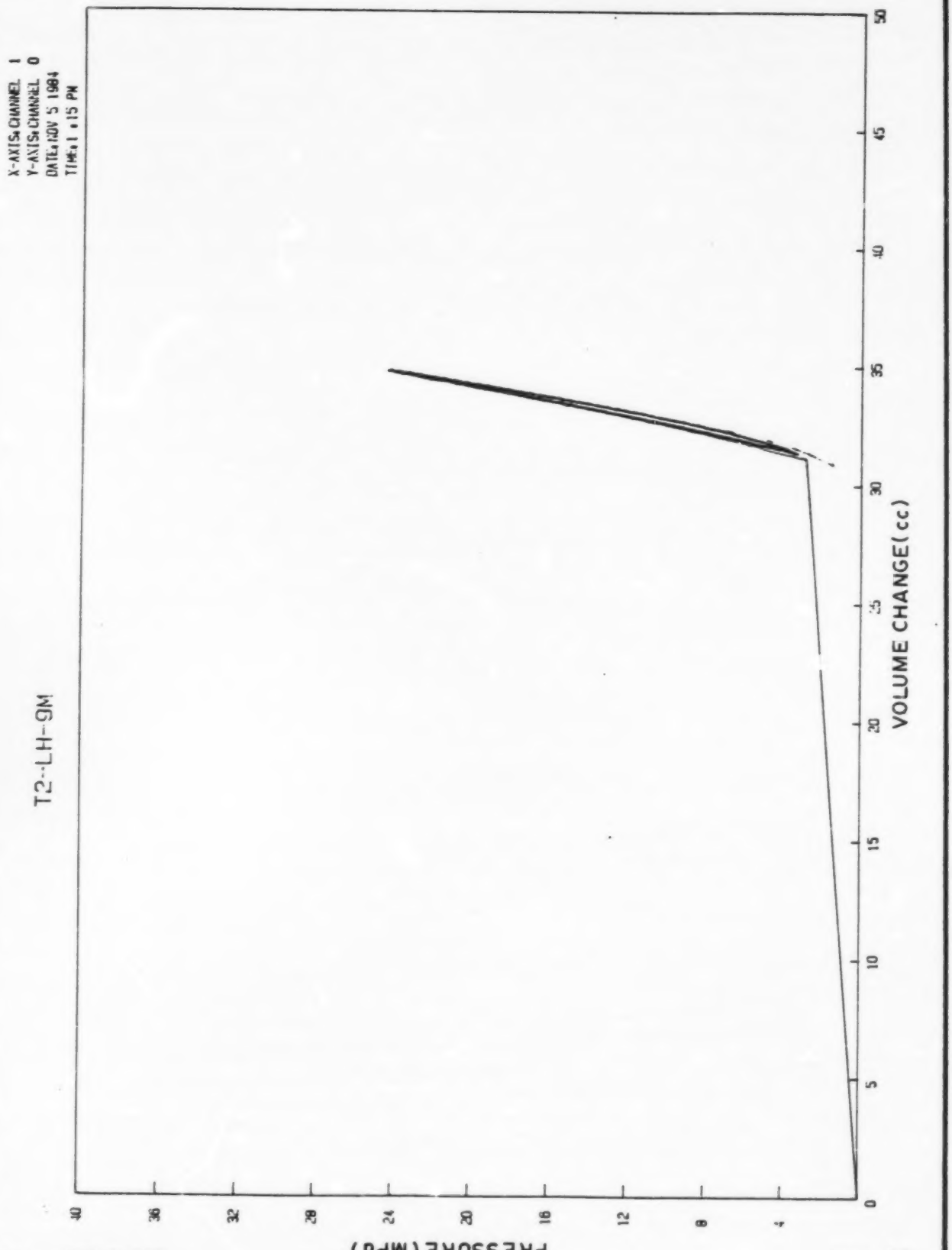
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-9M

FIGURE D.59



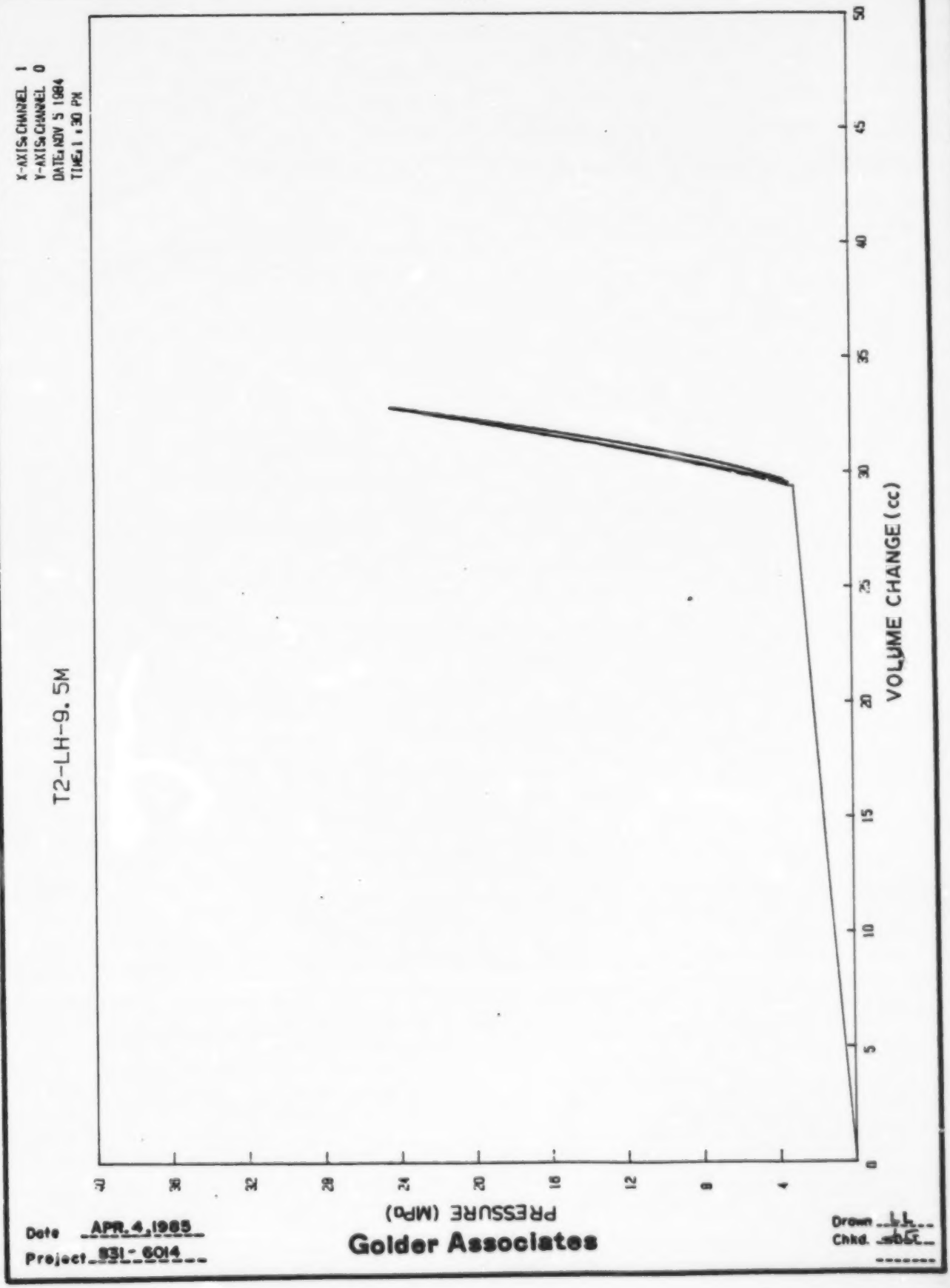
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. DJS

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-9.5M

FIGURE D.60



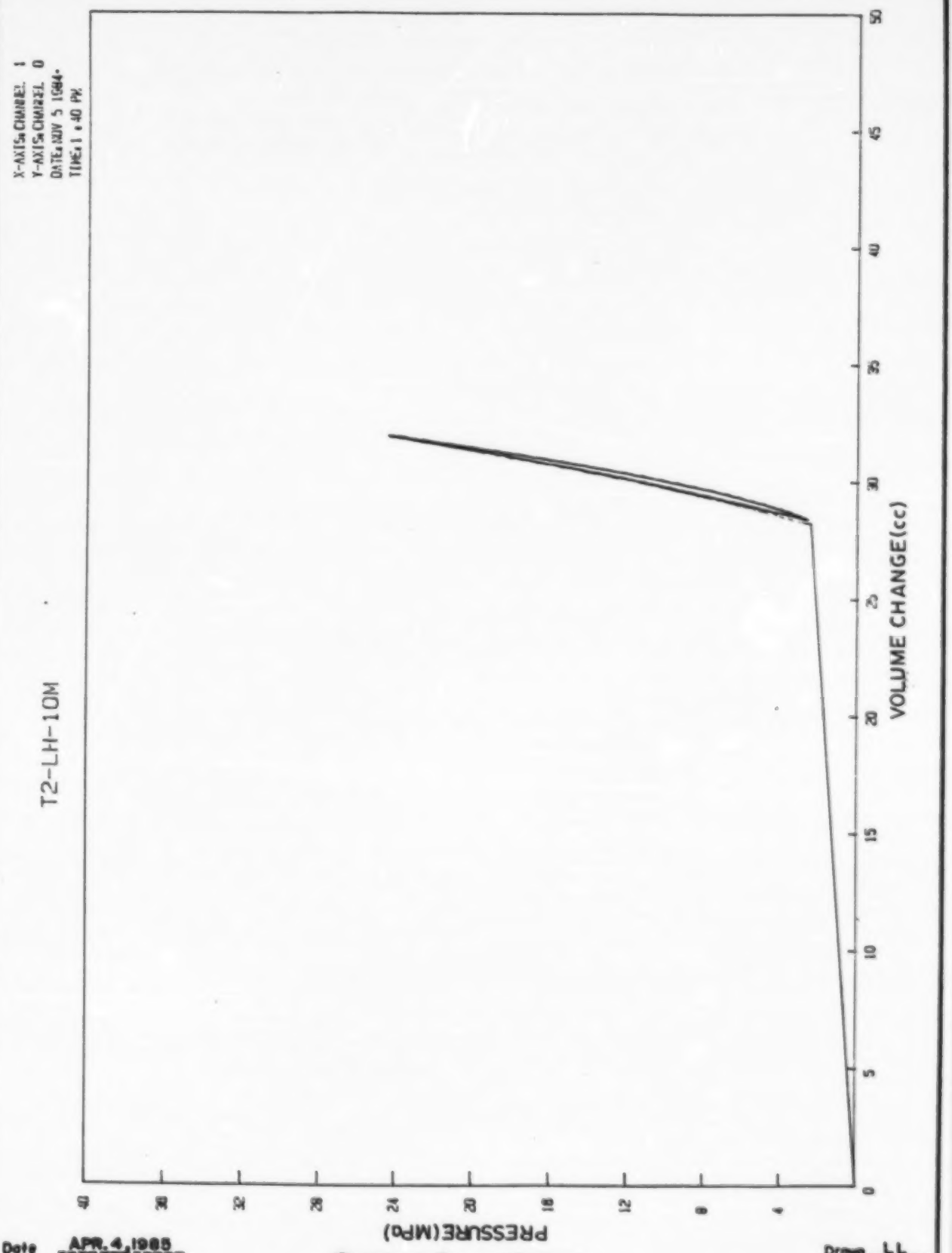
Date APR. 4, 1985
Project 931-6014

Golder Associates

Drawn LH
Chkd. sbd

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-10M

FIGURE D.61



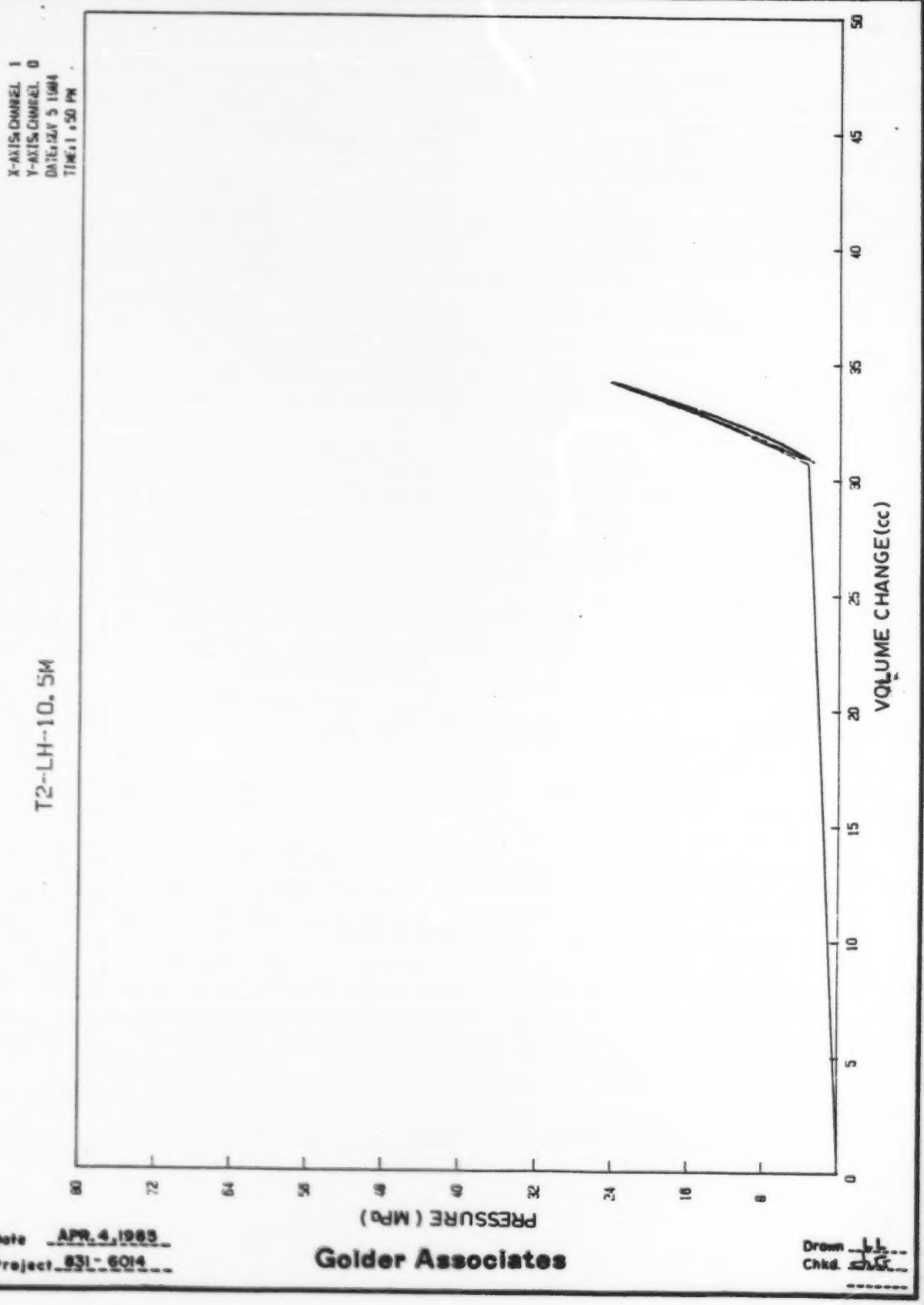
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-10.5 M

FIGURE D.62



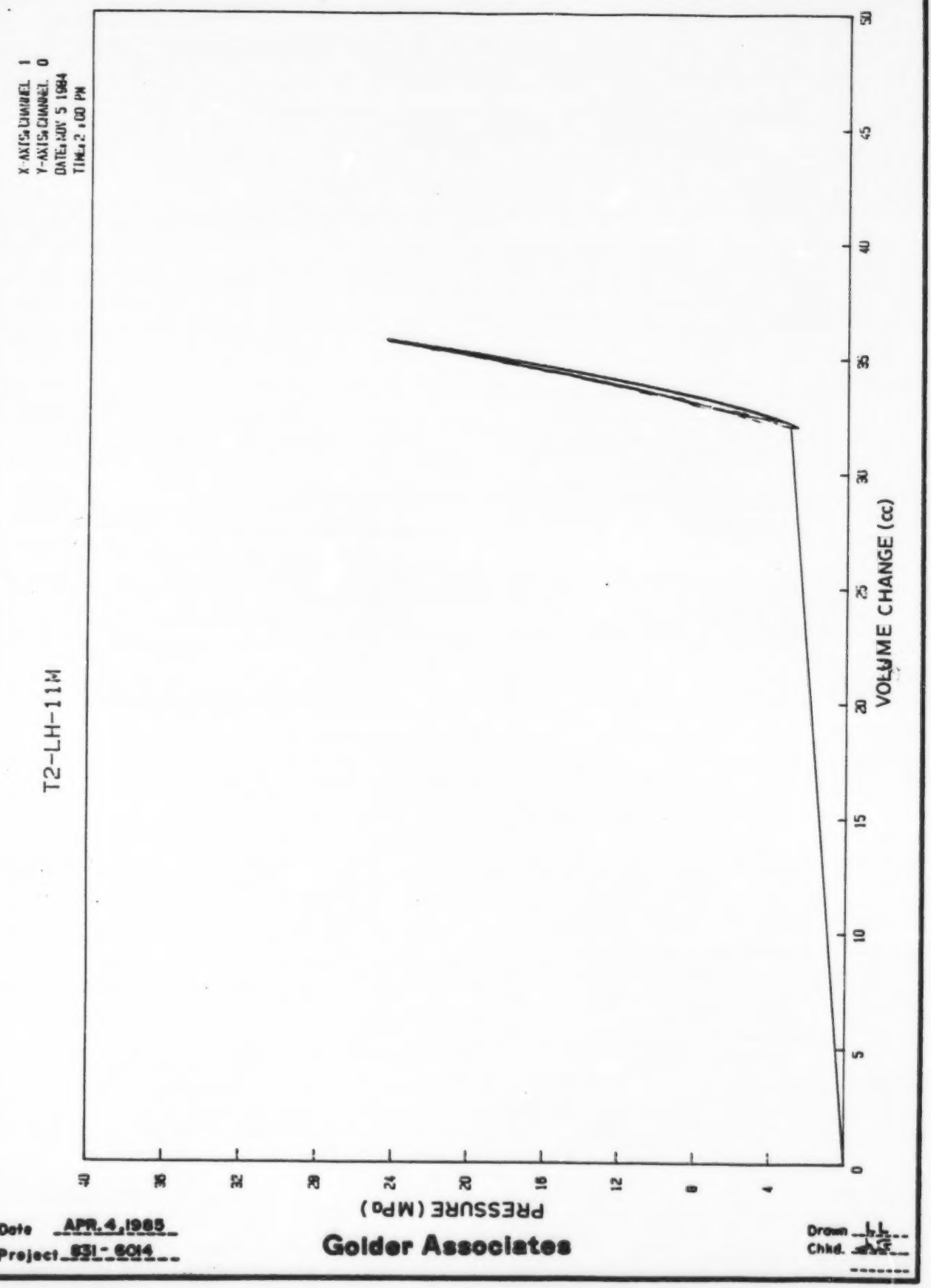
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. CMC

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-11M

FIGURE D.63



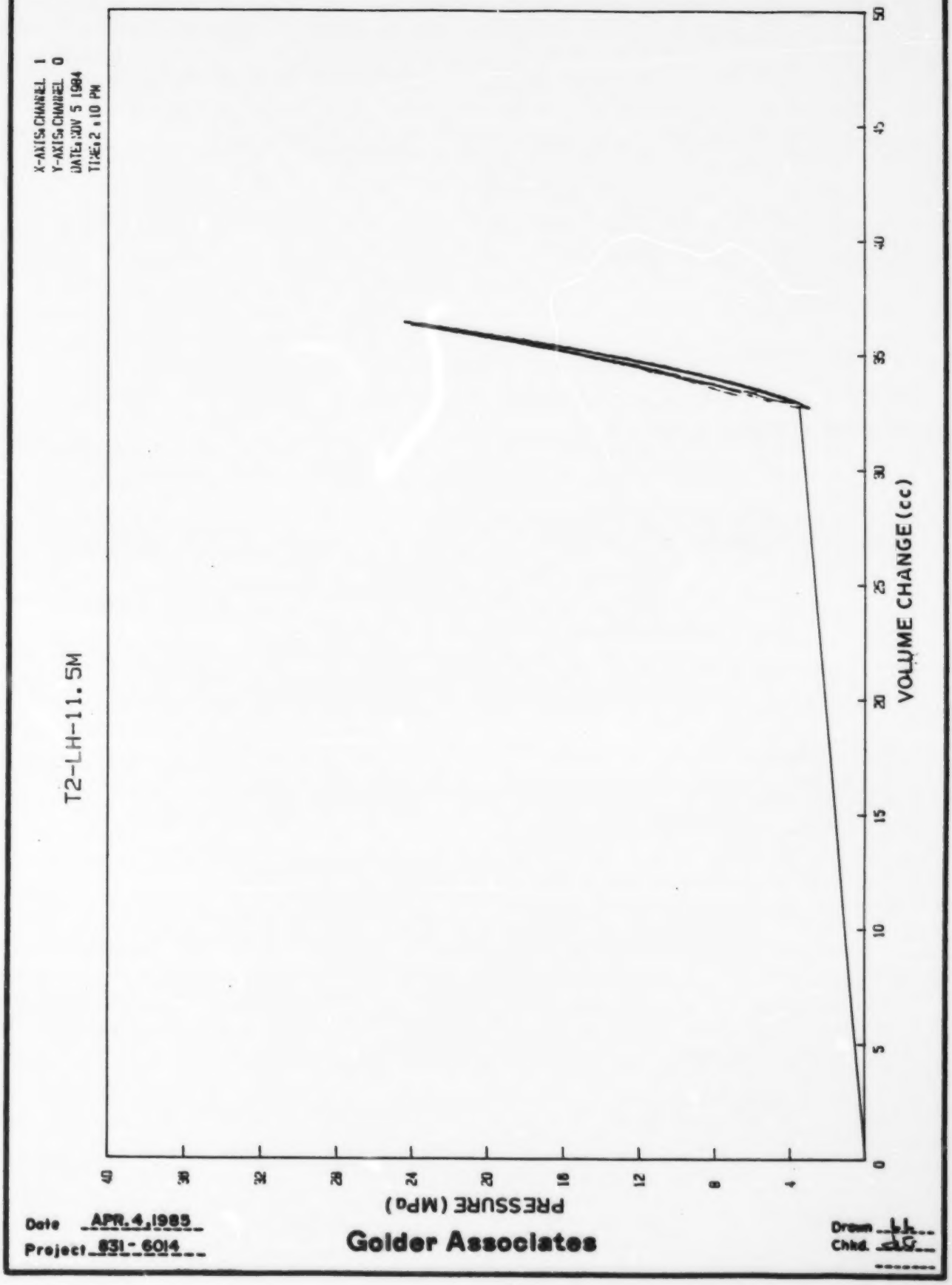
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn
Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-11.5M

FIGURE D.64



Date APR. 4, 1985

Project 831-6014

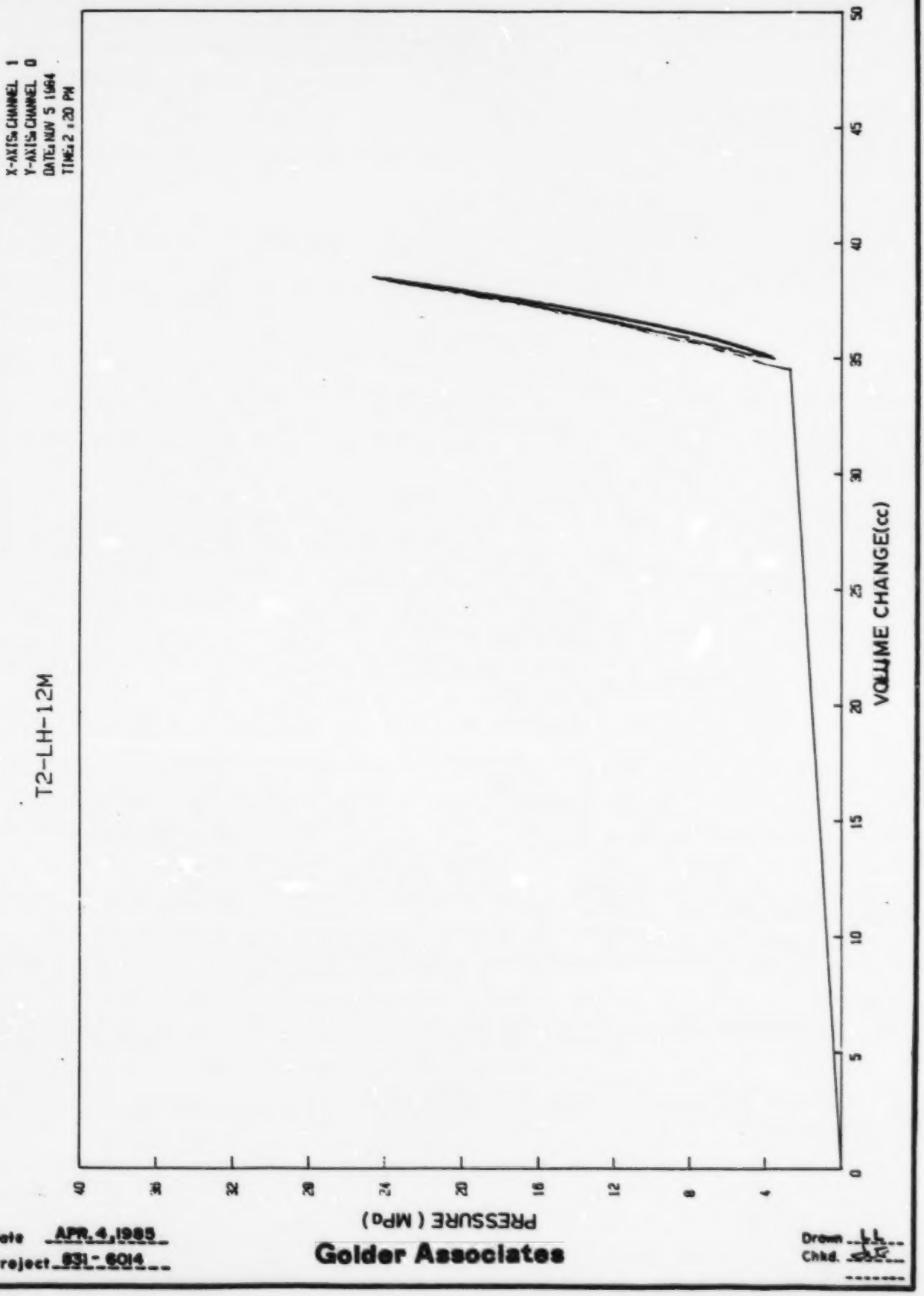
Golder Associates

Drawn

Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-12M

FIGURE D.65



Date APR.4,1985

Project 831-6014

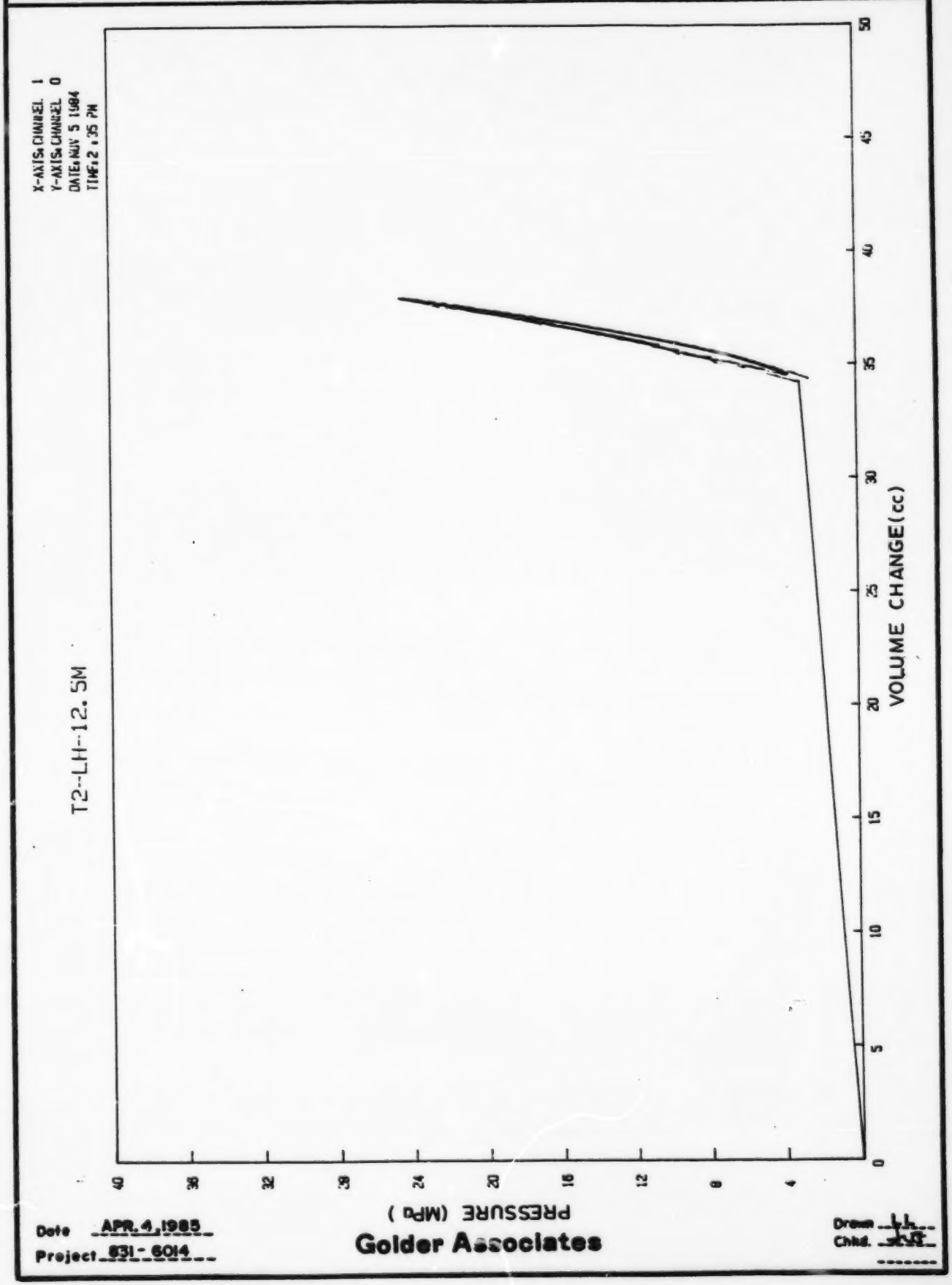
Golder Associates

Drawn LL

Chkd.

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-12.5M

FIGURE D.66



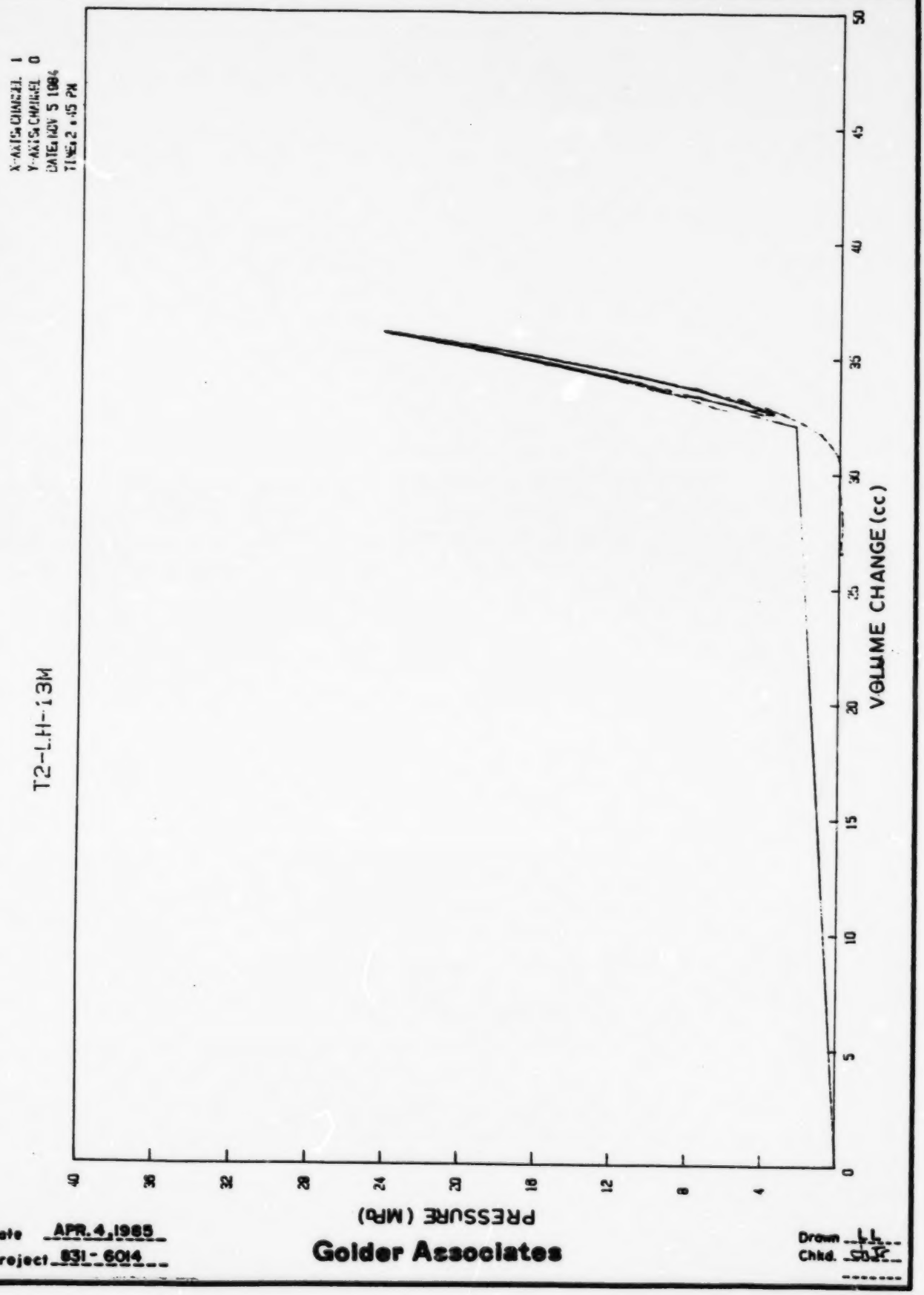
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LH
Chkd. JHT

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-13M

FIGURE D.67



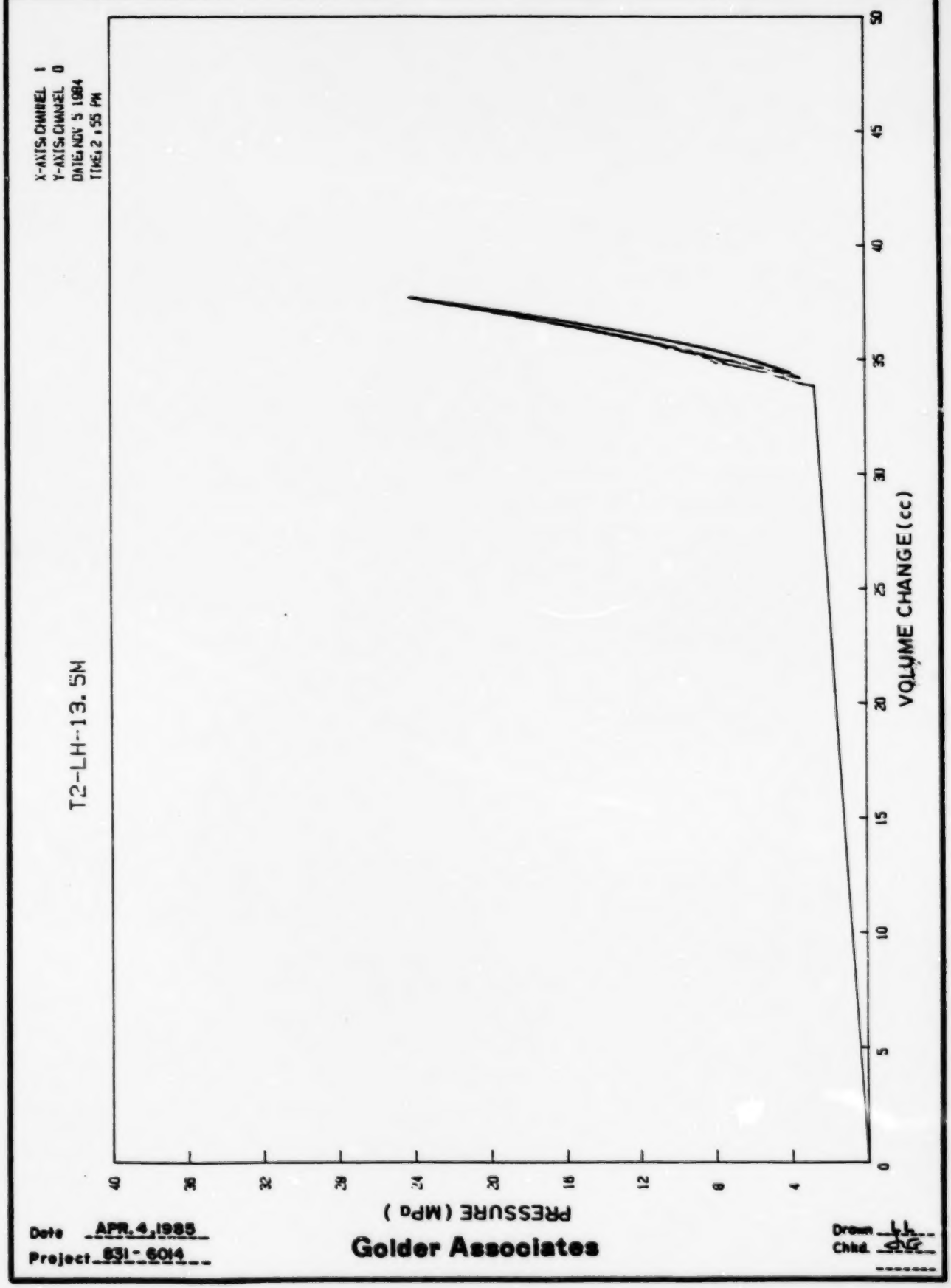
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. SDF

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-13.5M

FIGURE D.68



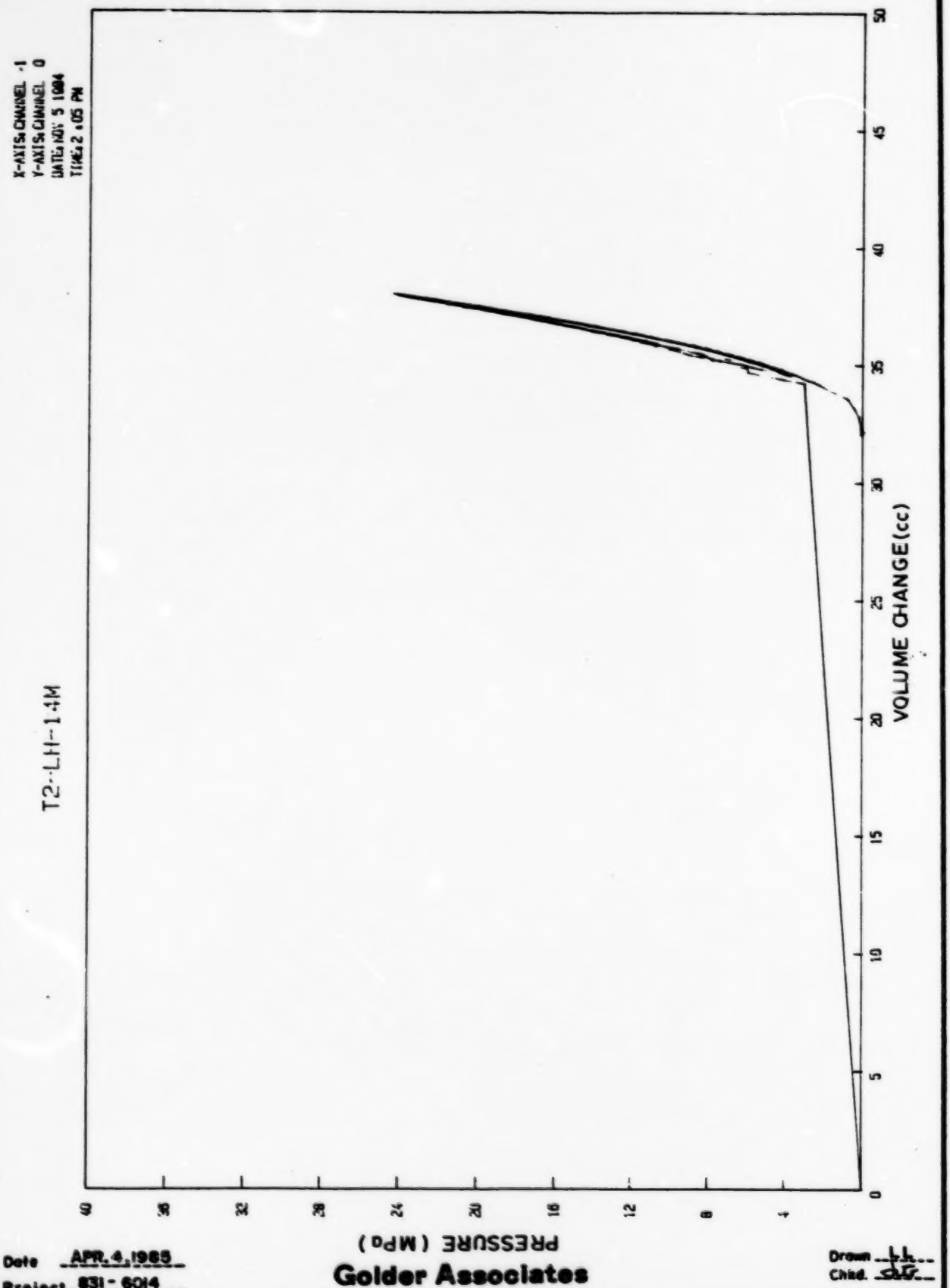
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LH
Chkd. [illegible]

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-14M

FIGURE D.69



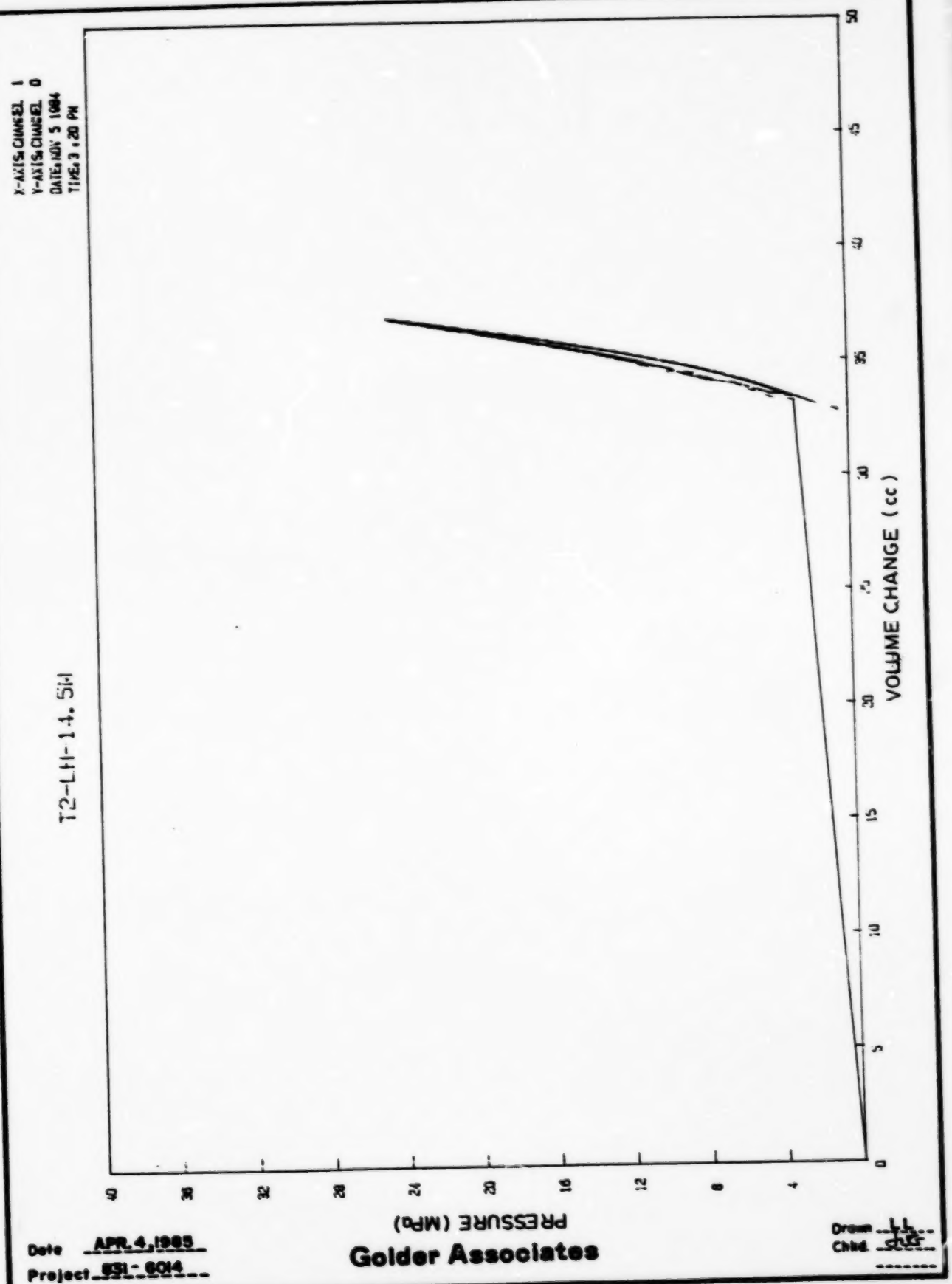
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. SAV

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO. T2-LH-14.5M

FIGURE D.70



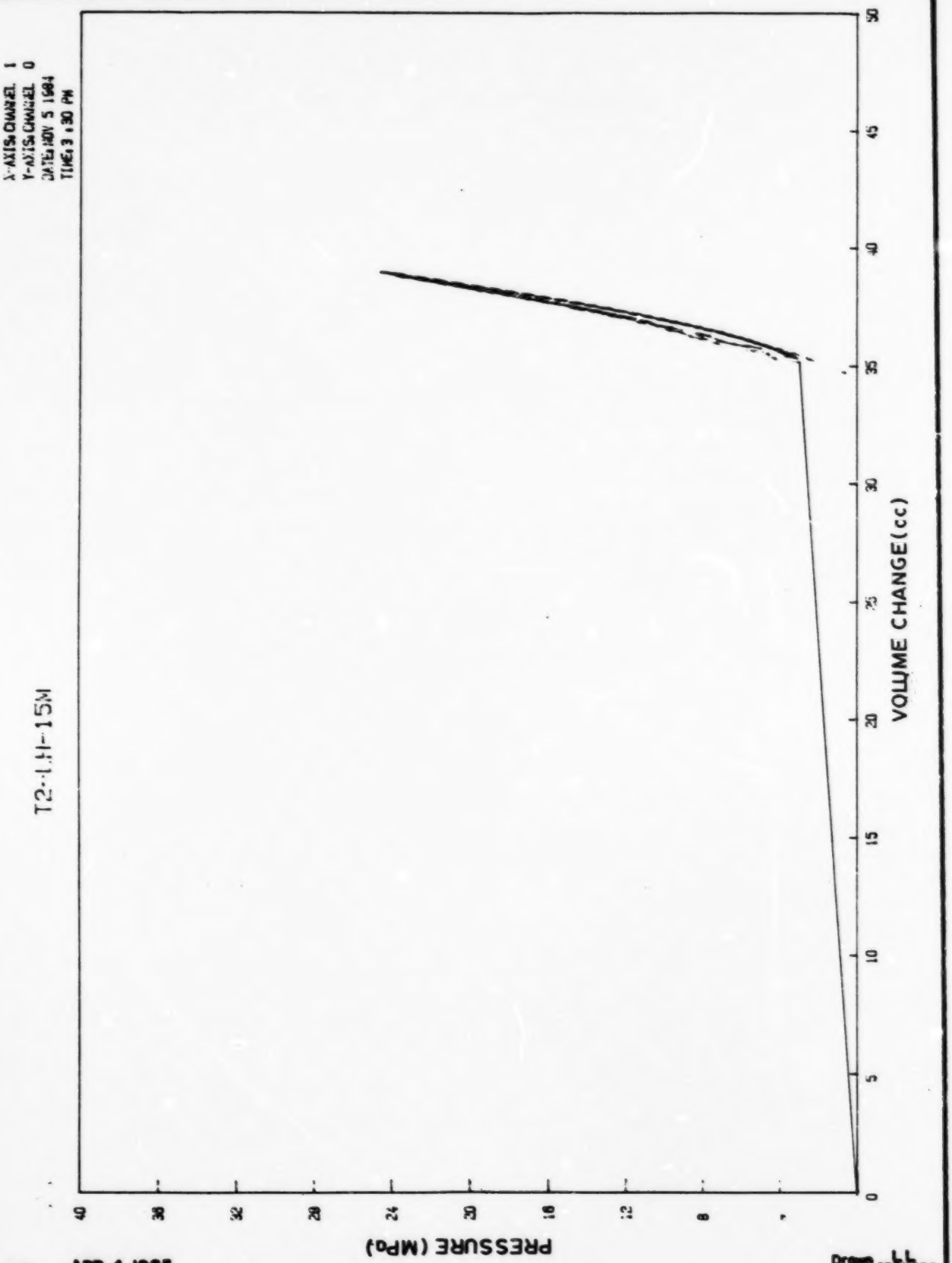
Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LLL
Chkd. GHF

RESULTS OF IN SITU MODULUS DETERMINATION
TEST NO.T2-LH-15M

FIGURE D.71



Date APR. 4, 1985
Project 831-6014

Golder Associates

Drawn LL
Chkd. GKP

APPENDIX E

MISCELLANEOUS TESTING

APPENDIX E-1

PETROGRAPHIC AND MINERALOGY ANALYSIS

(Refer to Table 7.14 for
Sample Sources)

Bore Hole 2, Sample 1, 5.23-5.40 m

LITHIC ARENITE WITH KAOLINITE CEMENT

CORE SAMPLE

Fine to medium grained sandstone composed of green clay-rich lithic fragments (shales), grey quartz, pink iron oxide stained fragments (chert) and opaque-rich fragments, set in a fine, soft, white, clay cement. Alternating fine and medium grained layers on the scale of 2 mm to 1 cm have gradational contacts.

PETROGRAPHY

44.6% quartz, monocrystalline grains	0.15-0.30 mm
16.2% quartz, polycrystalline fragments	"
20.2% shale	"
3.5% quartz-feldspar fragments (granitc).	"
2.6% chert	"
1.6% graphite-clay-mica fragments	"
1.2% sphene agregates	
0.7% muscovite	0.2-0.5 mm
0.2% biotite	"
0.2% chlorite	"
0.5% plagioclase	
0.5% microcline	
≤0.1% zircon	
≤0.1% celadonite clasts	
≤0.1% opaques	
≤0.1% tourmaline	
8.0% kaolinite cement	

Types based on origin	
quartz	44.6%
feldspar	1.0%
phyllosilicates	1.1%
lithic fragments	45.3%
heavy minerals	≤0.2%
kaolinite cement	8.0%

Types based on hardness	
quartz, feldspar	67.9%
shales	21.8%
micas, chlorite	1.1%
kaolinite cement	8.0%

The rock is composed of clastic quartz grains and a wide variety of lithic fragments: polycrystalline quartz of granitic origin, granitic quartz-feldspar fragments, fine grained clay-muscovite-quartz shale fragments, graphitic shale, chert, and spongy masses of sphene of metamorphic origin. Quartz and feldspar grains and lithic fragments are 0.15-0.30 mm in size, with somewhat larger detrital micas and chlorite. Grains are immature, being angular to subangular in form, but well sorted by size into fine and medium grained layers on a scale of 2mm-1cm. The long axes of elongate grains and shale fragments lie in the bedding plane. The rock is well compacted by deformation of the softer shale and mica fragments around the harder quartz and feldspar grains. Interstices have been filled by a very fine grained (less than 0.01 mm) authigenic, clay cement, whose optical properties and vermicular form correspond to kaolinite.

Bore Hole 2, Sample 2, 16.76-16.95 m

LITHIC ARENITE WITH KAOLINITE CEMENT

CORE SAMPLE

A massive, homogeneous, fine grained sandstone without stratification, composed of grey quartz, green shale fragments, dark opaque-rich fragments, and some pink, iron-stained grains. These are set in a soft, white, kaolinite cement. Bedding is defined by alignment of the long axes of grains and fragments.

PETROGRAPHY

58.5%	quartz, monocrystalline grains	0.1-0.2 mm
3.6%	granitic fragments, polycrystalline quartz ± feldspar	"
23.3%	shale	"
0.7%	opaque-rich shale	"
1.5%	chert	"
0.4%	microcline	"
0.4%	chlorite	
0.7%	opaques	
0.4%	zircon	
each	biotite	
less	muscovite	
than	celadonite clasts	
0.1%	sphene clasts	
	tourmaline	
10.5%	kaolinite cement	

Types based on origin		Types based on hardness	
quartz	58.5%	quartz, feldspar	64.0%
feldspar	0.4%	shales	24.0%
phyllosilicates	0.4%	micas, chlorite	0.4%
lithic fragments	29.1%	kaolinite cement	10.5%
heavy minerals	1.1%		
kaolinite cement	10.5%		

Quartz and lithic fragments are of fine sand size and uniform in size throughout the sample which lacks stratification. Grains are immature, being angular to subangular in form. Alignment of the long axes of inequigranular quartz and mica grains and lithic fragments defines bedding. Shale, micas and sphene aggregates are deformed around harder quartz and feldspathic fragments by compaction. Interstices are filled by very fine grained (<0.01 mm) kaolinite cement.

Yellow-brown siderite grains are irregularly distributed in the sample and thin section, tending to form high concentrations in local areas. Some of these are cored by fine grained, clear calcite and surrounded by coalescing siderite grains.

Bore Hole 7, Sample 3, 11.13-11.27 m

SIDERITE-CALCITE SILTSTONE

CORE SAMPLE

Dark greenish grey siltstone lacking any stratification and with brown areas 1 mm-1 cm in size of siderite ooids, some cored by grey calcite.

PETROGRAPHY

33.6% clays-illite, smectite	
20.0% quartz	0.04-0.1 mm
35.0% siderite	0.04 m
6.4% calcite	
2.1% muscovite	
0.7% biotite	
0.7% chlorite	
1.4% opaque	

Types based on hardness

quartz	20.0%
siderite	35.0%
micas, chlorite	3.5%
calcite	6.4%
clays	33.6%

Quartz is subangular in form, and of silt to very fine sand grain size. Micas are a little coarser and clays a little finer grained. Clay minerals have similar optical properties to those in other fine grained samples of this suite, and are probably illite and smectites.

The modal composition is an average of both sandstone and siltstone portions of the sample. Clays are more abundant in siltstone and less abundant in sandstone; the opposite holds for quartz and calcite distributions. The grain size of angular quartz varies from less than 0.05 mm in siltstone, to greater than 0.1 mm in fine sandstone with an overall range of 0.02–0.20 mm. Clays and micas show a similar size range. Parallel alignment of phyllosilicates imparts a moderate fissility to finer grained, silty layers. The clay minerals are probably illite and smectites.

B. CARBONATE UNIT

40.0% calcite

32.5% siderite

20.0% quartz 0.05–0.1 mm

5.0% muscovite

2.5% opaque

Types based on hardness

quartz	20.0%
siderite	32.5%
mica	5.0%
calcite	40.0%

Ooids 0.1–0.2 mm in diameter have cores of clear, spherulitic calcite variably replaced from the margins by yellow-brown siderite. Angular quartz grains are of very fine sand size.

Bore Hole 7, Sample 2, 7.99-8.11 m

QUARTZ WACKE-SILTSTONE AND CARBONATE

CORE SAMPLE

A heterogeneous sediment of:

1. Medium-pale grey, fine grained, calcite-bearing sandstone with dark grey siltstone laminations 0.2-8 mm thick. Cross-bedded.
2. Brown calcite-siderite-quartz carbonate unit 5-10 mm thick. Cross-bedded on a centimeter scale.

PETROGRAPHY

A. SANDSTONE-SILTSTONE

40.2% quartz	0.02-0.20 mm
40.2% clay-illite, smectite	
6.3% muscovite	
5.4% biotite	
0.9% chlorite	
0.9% sphene	
2.7% opaque	
3.6% calcite cement	

Types based on hardness

quartz	40.2%
micas, chlorite	12.6%
calcite cement	3.6%
clays	40.2%

Types based on hardness

quartz, feldspar	57.0%
sandstone, siltstone, schist	12.3%
shale	5.8%
micas, chlorite	1.1%
barite, calcite	7.9%
clays	15.9%

The detrital components of this rock are virtually identical in type and origin to those in lithic arenite sample 1 from bore hole 5. Differences are minor—less quartz and shale clasts, and more schist than in sample 5-1, as well as the presence of a small amount of microcline, will have a negligible effect on the hardness of this sample relative to that of 5-1. The amount of kaolinite cement is similar in each sample. The only significant difference is the presence in 6-2 of 6% of coarsely crystalline barite as an interstitial cement.

Bore Hole 6, Sample 2, 17.73-17.92 m

LITHIC ARENITE WITH KAOLINITE-BARITE CEMENT

CORE SAMPLE

A massive, coarse grained sandstone without any stratification, composed of grey quartz grains and a variety of lithic fragments including green sedimentary and metamorphic clasts, and black, opaque-rich clasts in a soft white, kaolinite cement. Bedding is defined by parallel alignment of the long axes of clasts.

PETROGRAPHY

38.6% quartz, monocrystalline	0.5-0.8 mm
17.0% quartz, polycrystalline	0.5-1.0 mm
5.8% shale	"
2.5% siltstone	"
2.9% fine grained sandstone	"
0.7% chert	"
6.9% schist	"
0.7% microcline	"
0.7% chlorite	0.2-0.5 mm
0.4% muscovite	"
≤0.2% biotite	"
0.7% clay fragments	
15.2% kaolinite cement	
6.1 barite cement	
1.8% calcite cement	

Types based on hardness

quartz	64.2%
schist, sandstone, siltstone	4.6%
shale	10.7%
calcite cement	1.0%
clays	16.3%

Subangular quartz grains are of medium to coarse sand size throughout the sample. Some have rounded cores and angular overgrowths indicating derivation from erosion of a quartz arenite source rock.

A wide variety of lithic fragments 0.3-2 mm in size is present. These are:

1. Granitic-derived clasts-polycrystalline quartz, muscovite (but no feldspar).
2. Metamorphic clasts-muscovite-quartz schist and opaque-rich schist.
3. Sedimentary clasts-shale, siltstone, sandstone and siderite oolite similar to previously described rock samples, and chert.
4. Clay-muscovite clasts-altered feldspars?

There is no matrix material and the rock is well compacted by deformation of clay and mica-rich clasts around harder quartz fragments as well as by pressure solution between quartz grains.

Abundant fine-grained kaolinite, and minor clear calcite occur as cements in the interstices.

Bore Hole 5, Sample 1, 17.35-17.61 m

LITHIC ARENITE WITH KAOLINITE CEMENT

CORE SAMPLE

Massive, medium to coarse grained sandstone with very indistinct stratification caused by variations in the abundances of quartz and various types of lithic fragments. Visible are grey quartz grains, green mica and chlorite-rich fragments, pink, iron oxide stained fragments, and black opaque-rich fragments. These are set in a soft, white, clay matrix. Parallel alignment of the long axes of lithic fragments defines bedding.

PETROGRAPHY

47.8% quartz, monocrystalline grains	0.4-0.8 mm
16.4% quartz, polycrystalline grains	0.5-2.0 mm
10.7% shale	
0.3% siltstone	
1.0% fine sandstone	
≤0.2% chert	
2.7% siderite oolite	
3.3% schist	
2.3% clay fragments	
≤0.2% muscovite	
≤0.2% chlorite	
0.3% opaque	
1.0% calcite cement	
14.0% kaolinite cement	

The clay minerals which comprise most of the sample are very pale yellow-brown and green in thin section and of very fine grain size. They are probably illite and smectite. Muscovite is colourless and a little coarser grained. It may be derived by metamorphic/diagenetic alteration of clays.

Quartz is of silt grain size and angular to subangular in form. Alignment of the long axes of inequidimensional quartz grains with that of phyllosilicates imparts a slatey cleavage and directional weakness to the rock.

Ooids of siderite are concentrated in an irregular zone about 8 mm wide roughly parallel to the slatey cleavage and presumably to bedding. The ooids are composed of micritic (very fine grained), yellow-brown siderite and are 0.1-0.2 mm in size. The cores of some larger bodies are of coarse, radially arranged, sparry calcite, indicating the siderite may be a diagenetic replacement of the calcite. Pyrite is concentrated in shale around the ooids and may also be of diagenetic origin.

Bore Hole 3, Sample 5, 28.23-28.44 m

SHALE WITH SIDERITE OOIDS

CORE SAMPLE

A dark greenish-grey shale. Laminations in one part of the core are probably due to variations in the clay to quartz ratio, but do not appear in the portion that was thin-sectioned. Brown, iron oxide stained siderite forms a lenticular mass 2 mm thick, parallel to bedding, and concentrated in an irregular zone at a high angle to bedding, where it may be of algal origin.

PETROGRAPHY

33.9% quartz	0.01-0.02 mm
52.0% clays-illite, smectite	0.01 mm
3.5% muscovite	0.01-0.02 mm
2.2% chlorite	"
4.0% siderite ooids	0.1-0.2 mm diameter
4.4% opaque-pyrite	
≤0.2% sphene	
≤0.2% hematite	

Types based on hardness

quartz, pyrite	38.3%
siderite	4.0%
muscovite	3.5%
chlorite	2.2%
clays	52.0%

Types based on hardness

quartz	62.2%
micas, chlorite	23.5%
calcite cement	0.9%
clays	10.3%

Quartz is angular to subangular, of fine sand size, and equidimensional to elongate. The latter grains are oriented with their long axes parallel to bedding. Detrital muscovite and biotite flakes are parallel to bedding, a little larger than quartz grains, and contorted by differential compaction around quartz grains. Graphite masses up to 2 mm in length are concentrated in laminae up to 1 mm thick. Otherwise the rock is fairly homogeneous, without stratification.

Strong compaction, alteration and recrystallization of phyllosilicate-rich material between quartz grains has obscured textural relations indicating whether it is modified clay matrix or lithic fragments (shale). The lack of definable clasts may indicate it is matrix. This material is composed of muscovite, clays (probably illite and smectite), chlorite, opaques and heavy detrital minerals, with a grain size of 0.01-0.03 mm.

Siderite forms small micritic aggregates. There is a minor amount of clear calcite and kaolinite cement.

Bore Hole 3, Sample 3, 7.16-7.31 m

QUARTZ WACKE

CORE SAMPLE

Fine grained, light grey, quartz-mica sandstone. Opaque-rich (graphite?) laminae up to 1 mm thick define bedding and make up about 3% of the sample. Thinner lamellae are wispy and discontinuous, thicker ones are continuous across the sample.

PETROGRAPHY

61.3% quartz	0.1-0.2 mm
19.8% muscovite	0.1-0.4 mm
9.4% clays-illite, smectite	0.01-0.03 mm
0.9% biotite	0.1-0.4 mm
2.8% chlorite	"
0.9% chert	
0.5% zircon	
0.5% sphene	
0.9% rutile	
0.5% opaque	
0.5% graphite	
≤0.3% tourmaline	
≤0.3% siderite	
0.9% calcite cement	
0.9% kaolinite cement	

Types based on hardness

quartz	13.1%
siderite, calcite	80.3%
micas, chlorite	4.9%

The carbonate making up most of the ironstone is of very high refractive index, has a yellow-brown colour, and does not react to the alizarin red staining test for calcite, indicating it is almost certainly siderite, $FeCO_3$. It has a micritic texture, with a grain size of less than 0.05 mm, and contains evenly distributed, angular, silt-sized quartz grains and minor muscovite, chlorite, opaque and graphite. The ironstone is otherwise featureless, lacking stratification, and is a chemical sediment. Calcite is present in minor amount only.

Types based on hardness

quartz	59.9%
micas, chlorite	10.2%
calcite cement	1.1%
clays	19.7%

Quartz is angular to subangular and of uniform siltsize throughout. The platey minerals, muscovite, biotite, chlorite, clay and graphite, are slightly concentrated in the darker layers of the rock. Only the larger grains of those minerals are well aligned parallel to the bedding plane. This will impart a poor fissility and directional weakness to the rock. Smaller grains of platey minerals show a more random orientation between quartz grains.

The clay material is of fine grain size (0.01-0.03 mm) and very pale brown-yellow and green colours. It is probably mostly illite and smectite. Micas are slightly coarser grained (0.01-0.10 mm) and appear to be derived by diagenetic/metamorphic alteration of the sedimentary clay minerals. A minor amount of clear calcite occurs as cement.

B. IRONSTONE

79.1% siderite
1.2% calcite
13.1% quartz
3.3% muscovite
1.6% chlorite
1.6% opaque
≤0.5% graphite

Bore Hole 3, Sample 2, 4.92-5.10 m

CORE SAMPLE

Siltstone makes up three-quarters of the sample and siderite ironstone one-quarter.

The medium grey siltstone has dark grey, shaley (micaceous) laminations up to 1 mm thick. The laminae are not as regular or abundant as in the previous sample, are moderately contorted by soft sediment deformation, and make up about 10% of the siltstone component of the rock.

Massive ironstone is composed of siderite and quartz, with patchy staining by secondary iron oxide.

PETROGRAPHY

A. SILTSTONE

59.9%	quartz	0.03-0.08 mm
17.9%	clays-illite, smectite	0.01-0.3 mm
5.8%	muscovite	0.01-0.10 mm
0.6%	biotite	"
5.6%	chlorite	"
1.7%	sphene	
1.1%	rutile	
0.6%	zircon	
4.5%	opaque	
0.6%	graphite	
≤0.3%	siderite	
1.1%	calcite cement	
0.6%	hematite alteration	

Angular, silt-sized quartz grains range from equidimensional to elongate, the latter oriented parallel to bedding laminations and to clays and micas. Light coloured laminations contain about 70-80% quartz, and dark shaley laminations about 15-30% quartz as well as abundant clay, micas, and chlorite. Two types of opaque mineral are present, one is equidimensional (sulphide or iron oxide), the other elongate (possibly graphite). Hematite alteration is concentrated around the opaques. Calcite cement is minor.

Bore Hole 3, Sample 1, 2.91-3.06 m

LAMINATED SILTSTONE

CORE SAMPLE

A well laminated, micaceous siltstone. Individual laminations are less than 1.5 mm thick and consist of alternating, dark grey, mica-rich bands and light grey, quartz-rich bands. Cross-bedded units about 1 cm thick are made up of numerous laminations all at a low angle to those in adjacent units. Small brown patches throughout are stained by hematite alteration.

PETROGRAPHY

36.3% quartz	0.02-0.05 mm
39.5% clays-illite, smectite	0.01-0.02 mm
7.9% muscovite	0.01-0.10 mm
1.1% biotite	"
3.2% chlorite	"
1.6% sphene	
6.3% opaques	
<0.2% tourmaline	
1.1% calcite cement	
3.2% hematite alteration	

Types based on hardness

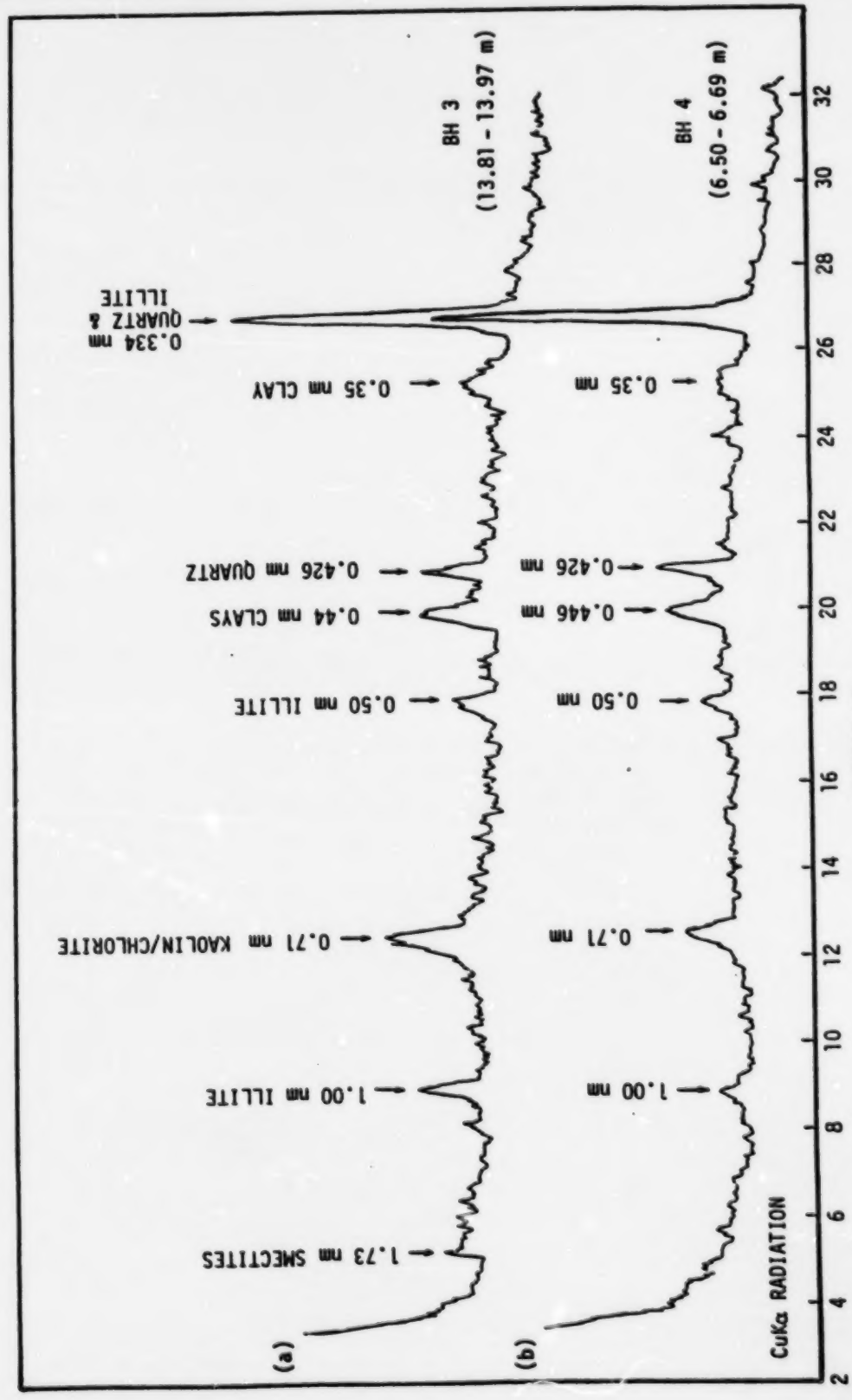
quartz	36.3%
micas, chlorite	12.2%
clays	39.5%

APPENDIX E-2

X-RAY DIFFRACTION RESULTS

X-RAY POWDER PATTERNS OF PULVERIZED WHOLE GREY MUDSTONE, (A) BH 3, 13.81 - 13.97 M; (B) BH 4, 6.50 - 6.69 M

FIGURE E.1



Date MAY 17, 1985
Project 831-6014

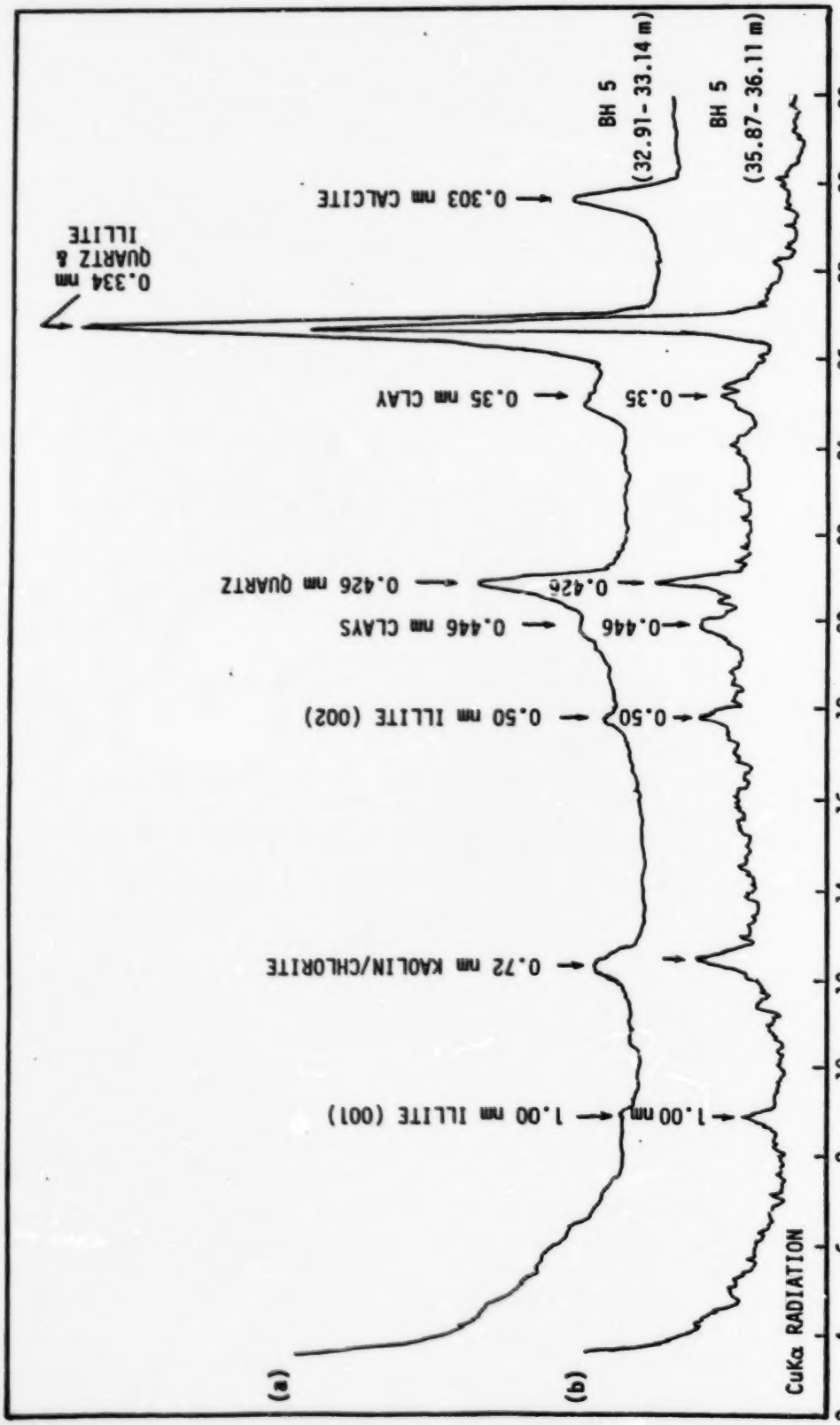
Golder Associates

Drawn B.P.
Chkd. [illegible]

Form G.A.-D.-4 (M)

X-RAY POWDER PATTERNS OF PULVERIZED WHOLE MUDSTONE, (A) BH 5, 32.91 - 33.14 M GREY; (B) BH 5, 35.87 - 36.11 M RED

FIGURE E.2



Date MAY 17, 1985
Project 851-6014

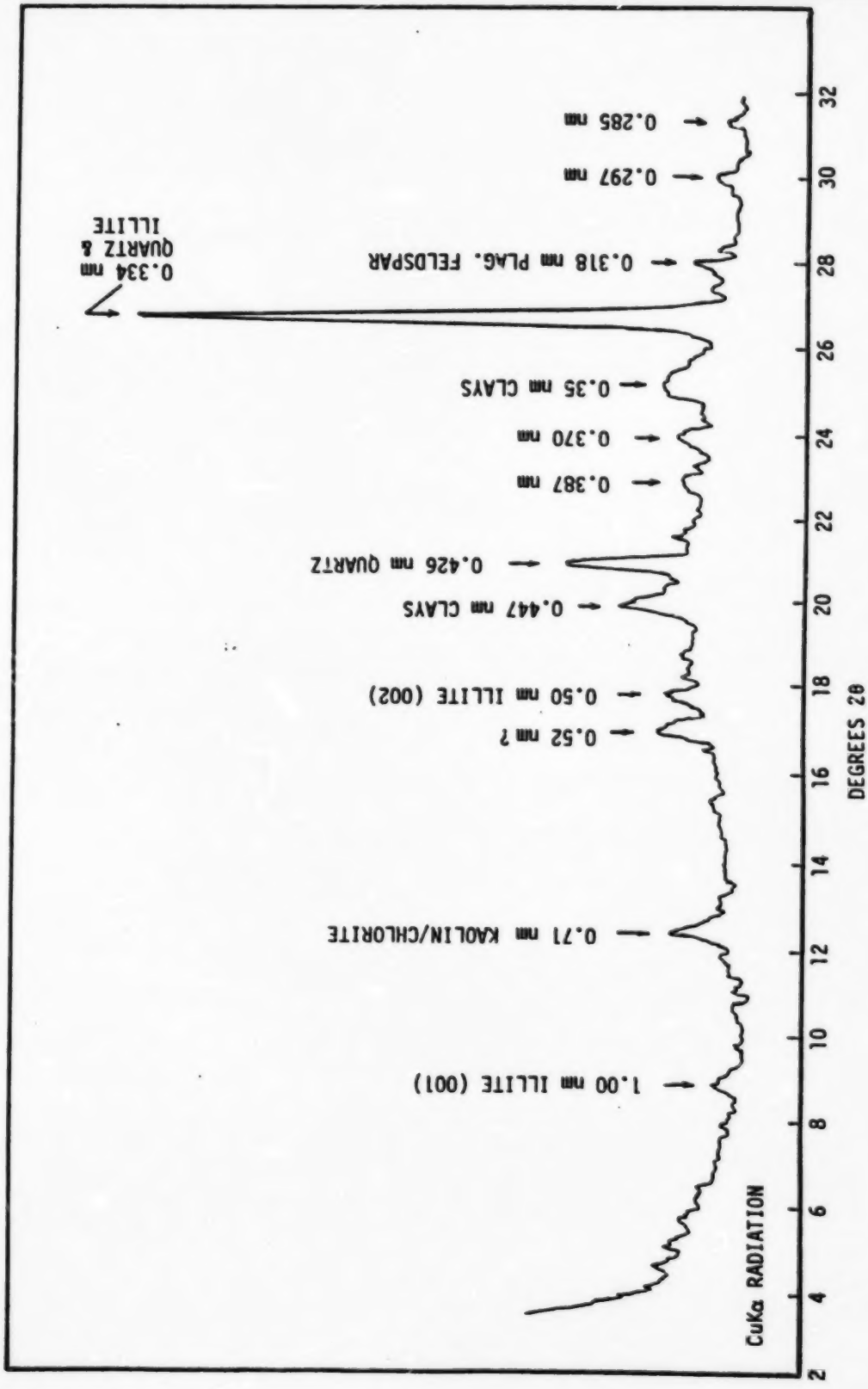
Golder Associates

Drawn G.P.
Chkd. CJS

Form G.A.-D.-4 (M)

X-RAY POWDER PATTERN OF PULVERIZED WHOLE GREY MUDSTONE, BH 7, 6.36 - 6.54 m

FIGURE E.3



Date MAY 17, 1985

Project 831-6014

Golder Associates

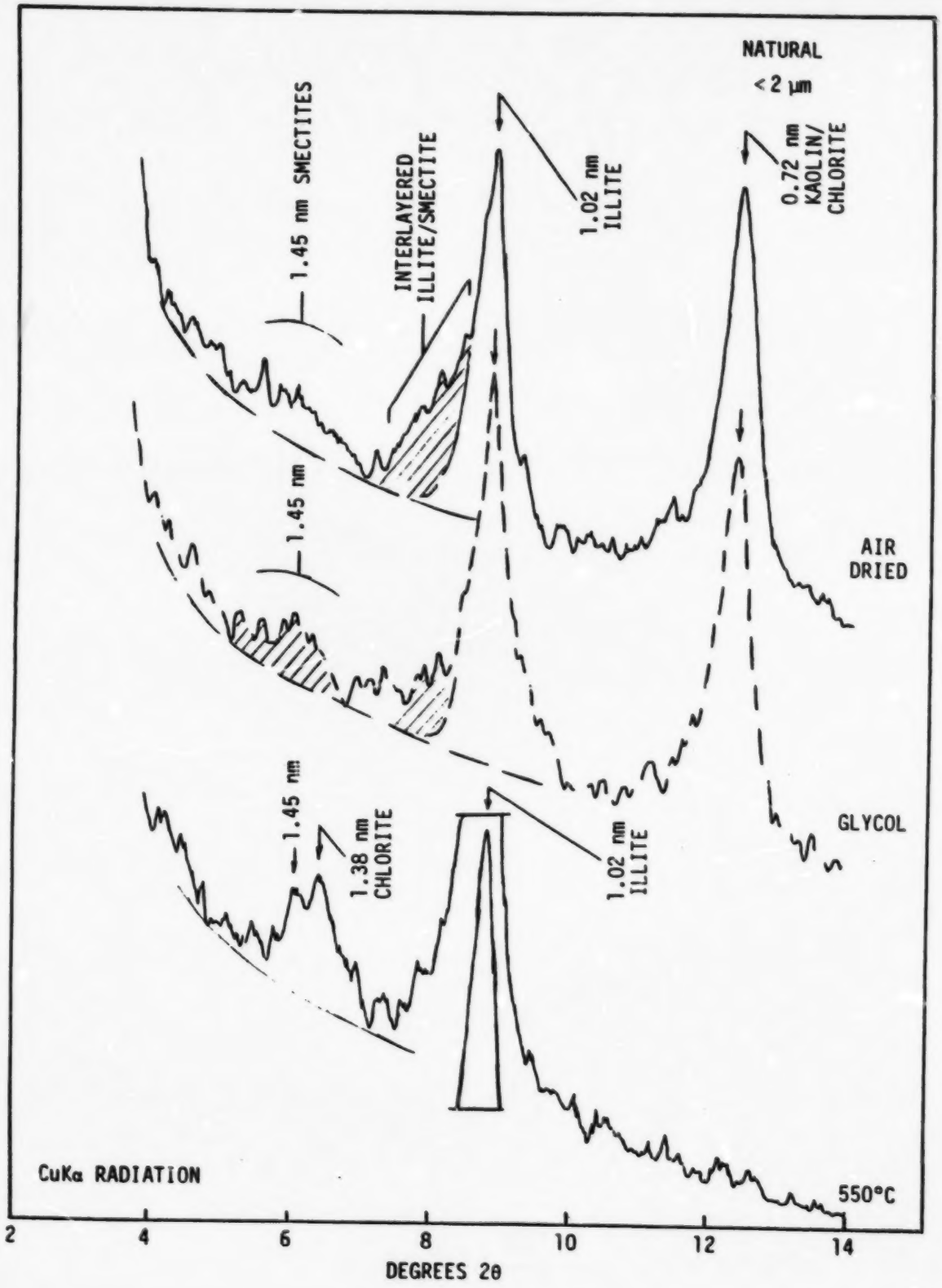
Drawn S.P.

Chkd. JJC

Form G.A.-U.-9 (M)

X-RAY TRACES OF ORIENTED, < 2 µm FINES, BH 3, 13.81 - 13.97 m, UNTREATED

FIGURE E.4(A)



Date MAY 17, 1985
Project 931-6014

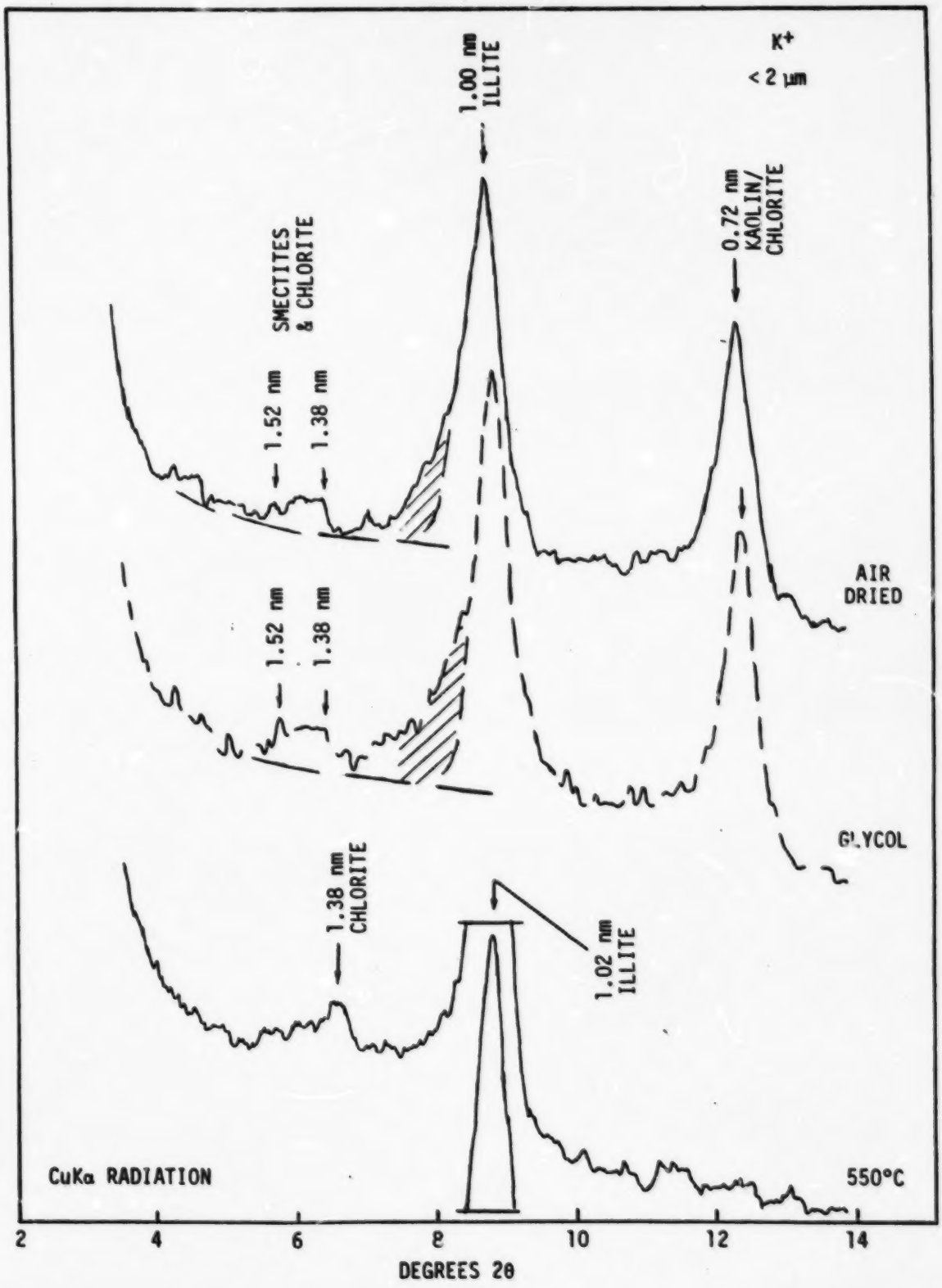
Golder Associates

Drawn G.P.
Chkd. SHT

Form Q.A.-D.-4 (M)

X-RAY TRACES OF ORIENTED, < 2 µm FINES, BH 3,
13.81 - 13.97 M, K^+ SATURATED

FIGURE E.4(B)



Date MAY 17, 1985
Project 831-6014

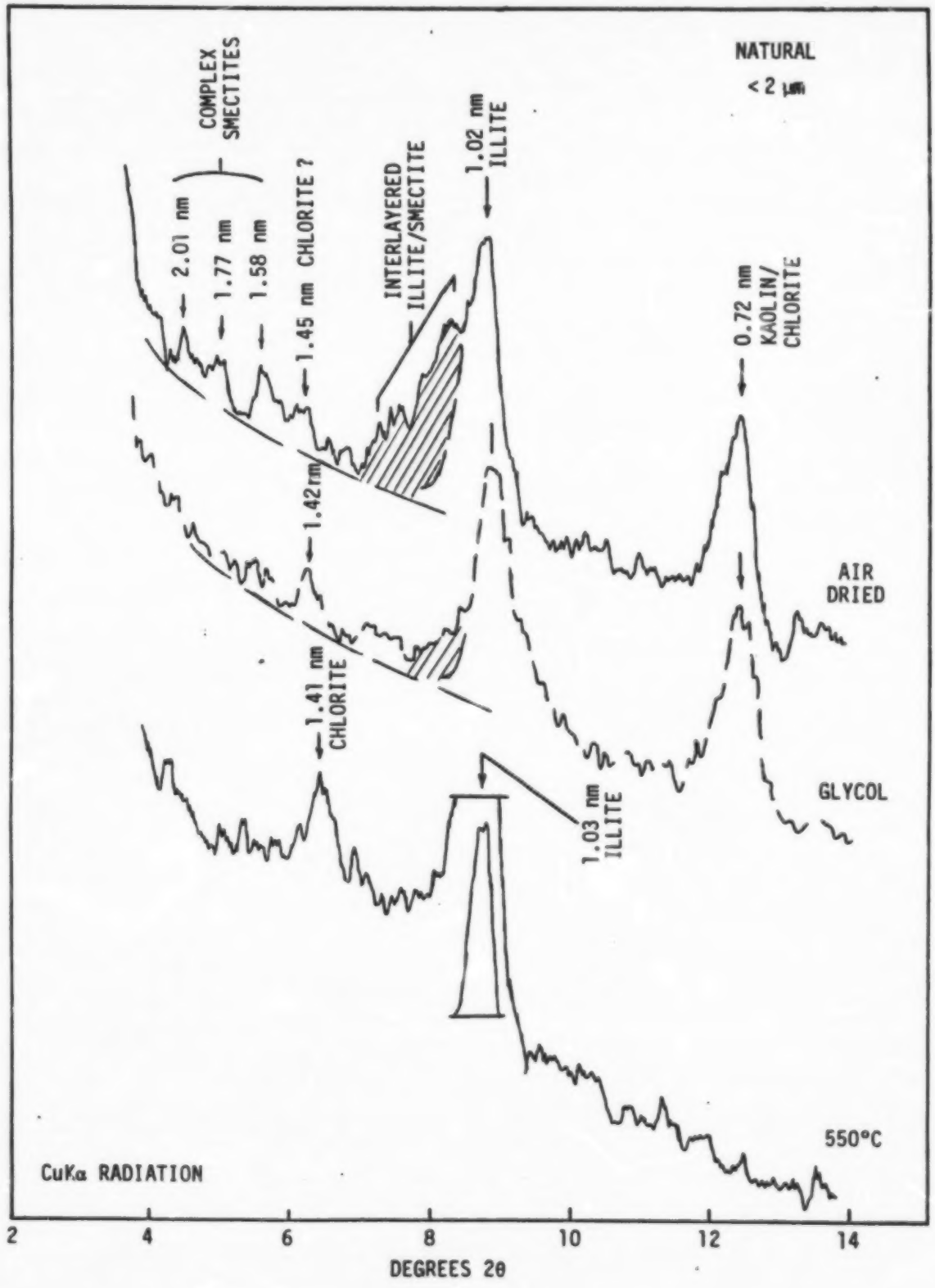
Golder Associates

Drawn G.P.
Chkd. [illegible]

Form G.A.-D.-4 (M)

X-RAY TRACES OF ORIENTED, < 2 µm FINES, BH 4,
6.5 - 6.69 m, UNTREATED

FIGURE E.5(A)



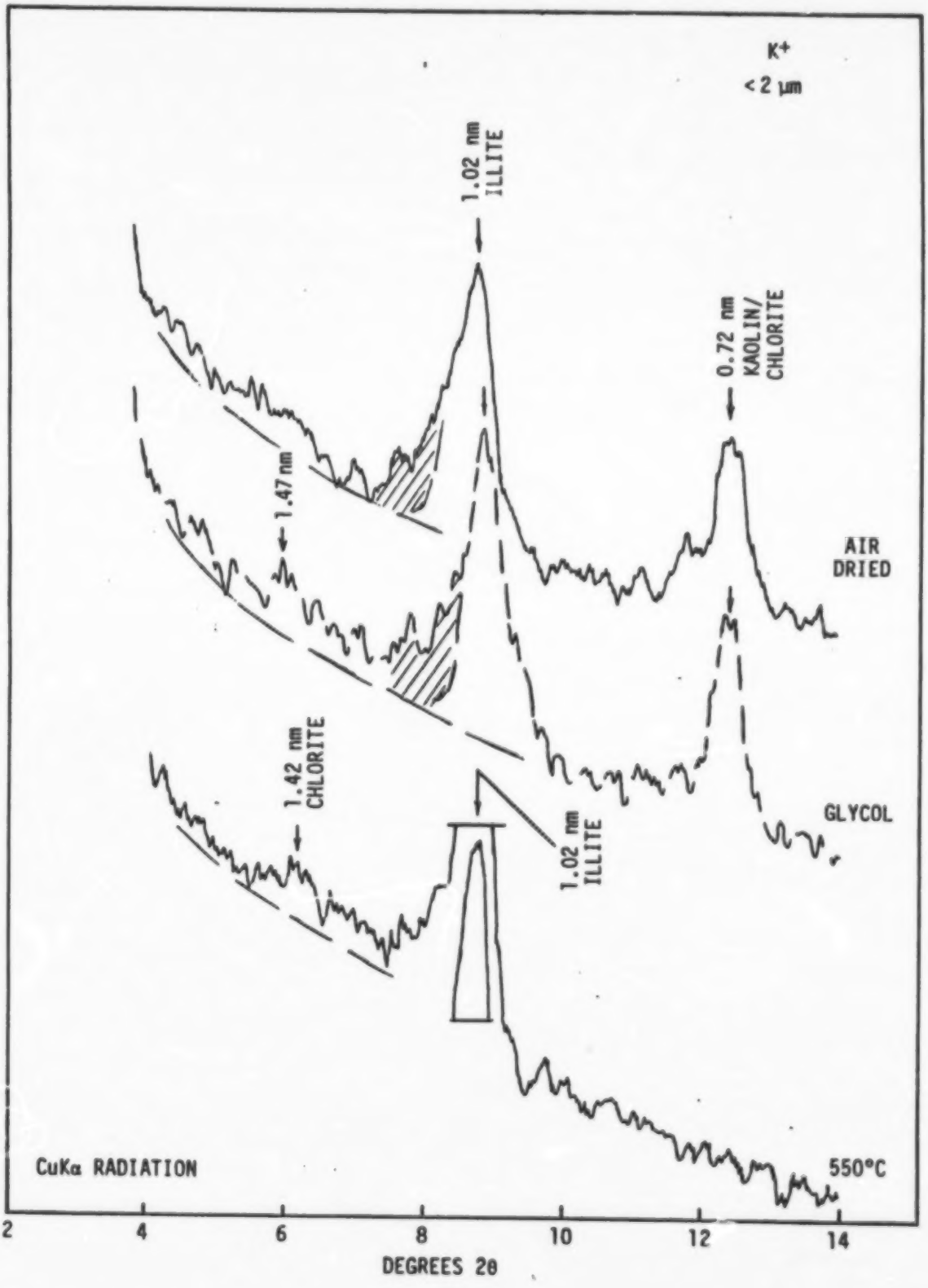
Date MAY 17, 1985
Project 831-6014

Golder Associates

Drawn G.P.
Chkd. GHT

X-RAY TRACES OF ORIENTED, < 2 µM FINES, BH 4,
6.5 - 6.69 M, K^+ SATURATED

FIGURE E.5(B)



Date MAY 17,1985
Project 831-6014

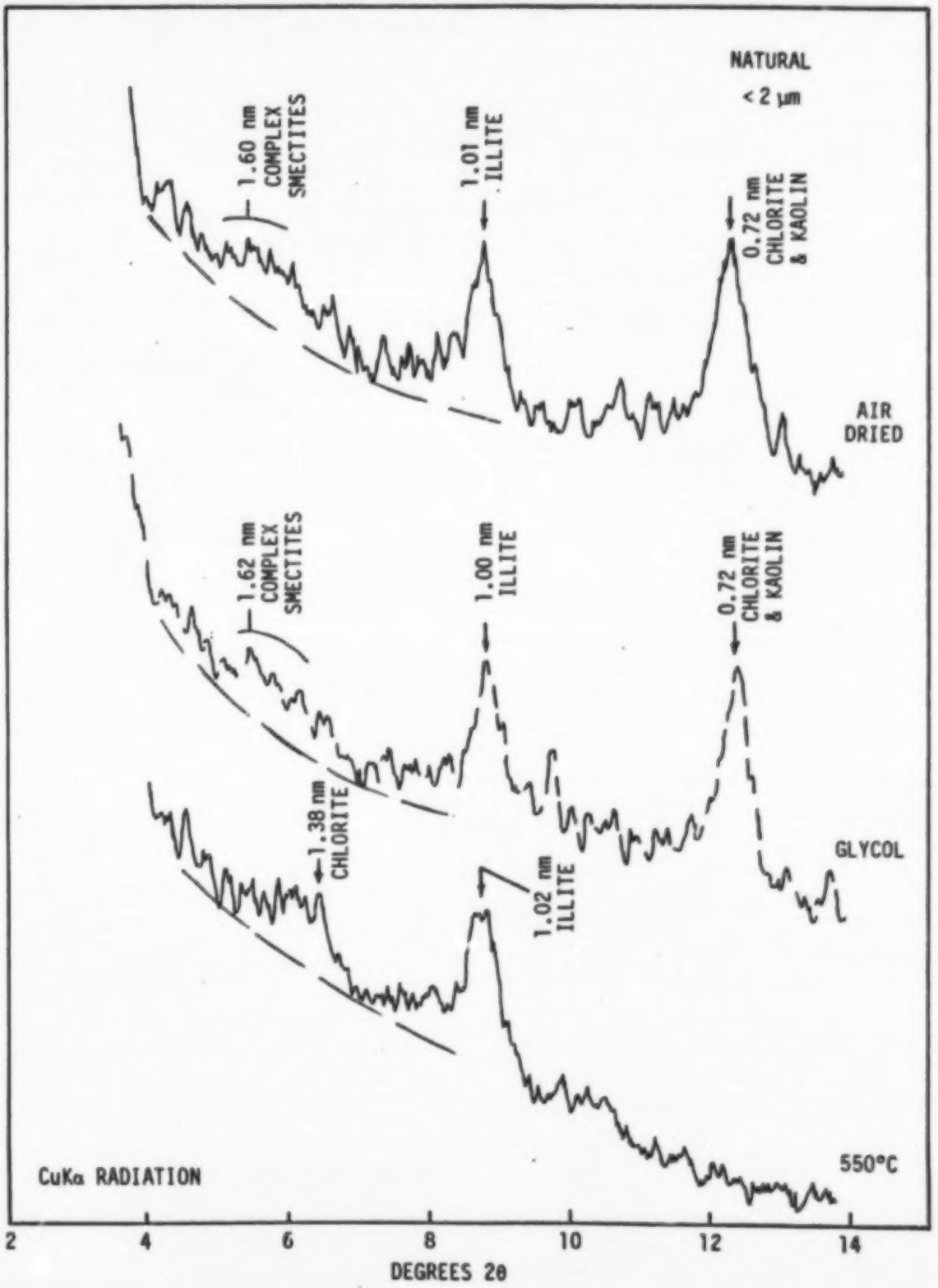
Golder Associates

Drawn G.P
Chkd.

Form G.A.-D.-4 (M)

X-RAY TRACES OF ORIENTED, < 2 µM FINES, BH 5,
32.91 - 33.14 M, UNTREATED

FIGURE E.6(A)



Date MAY 17, 1985
Project 851-6014

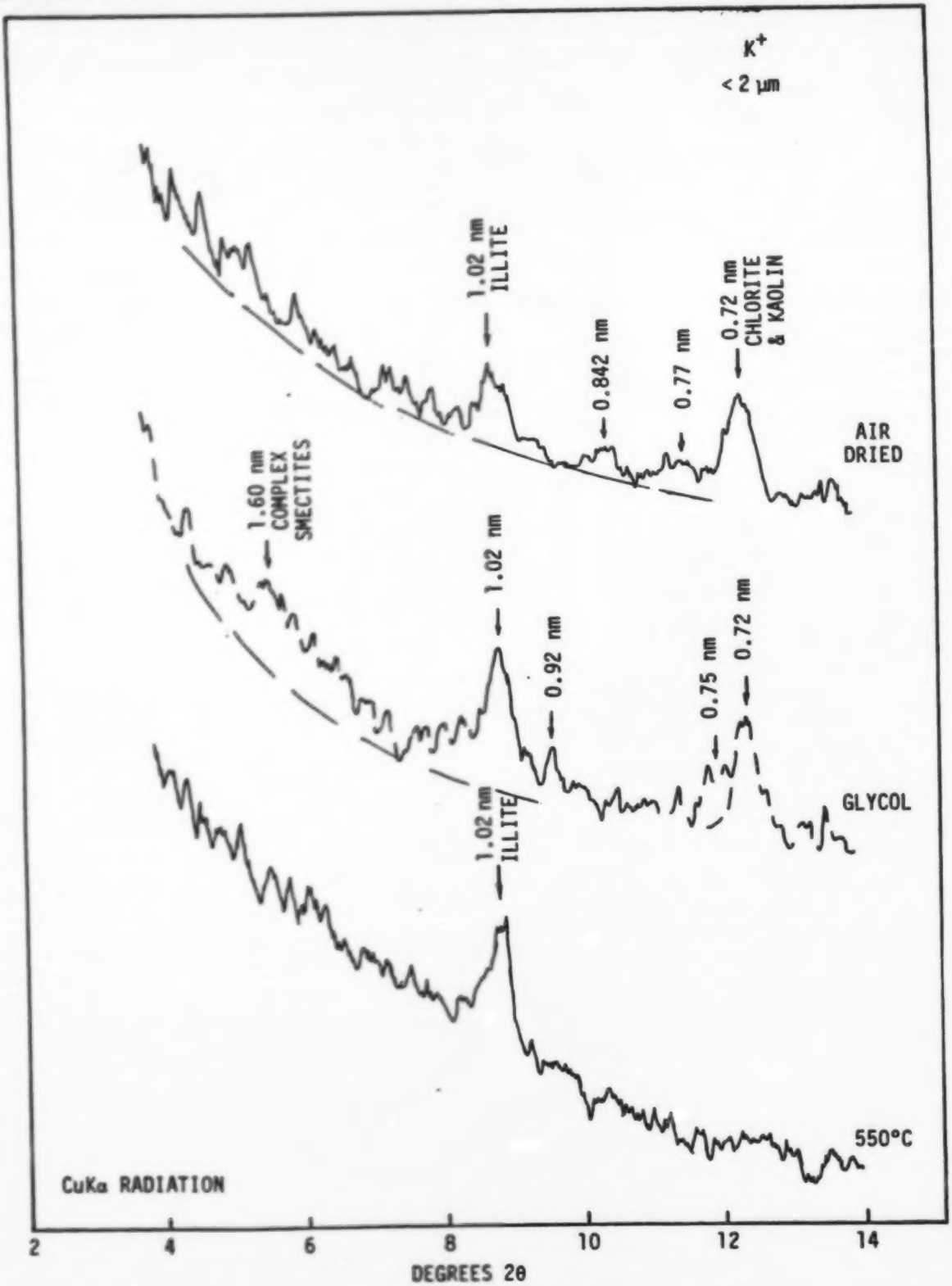
Golder Associates

Drawn G.P.
Chkd.

Form G.A.-D.-4 (M)

X-RAY TRACES OF ORIENTED, < 2 µm FINES, BH 5,
32.91 - 33.14 M, K^+ SATURATED

FIGURE E.6(B)



Date MAY 17,1985
Project 831-6014

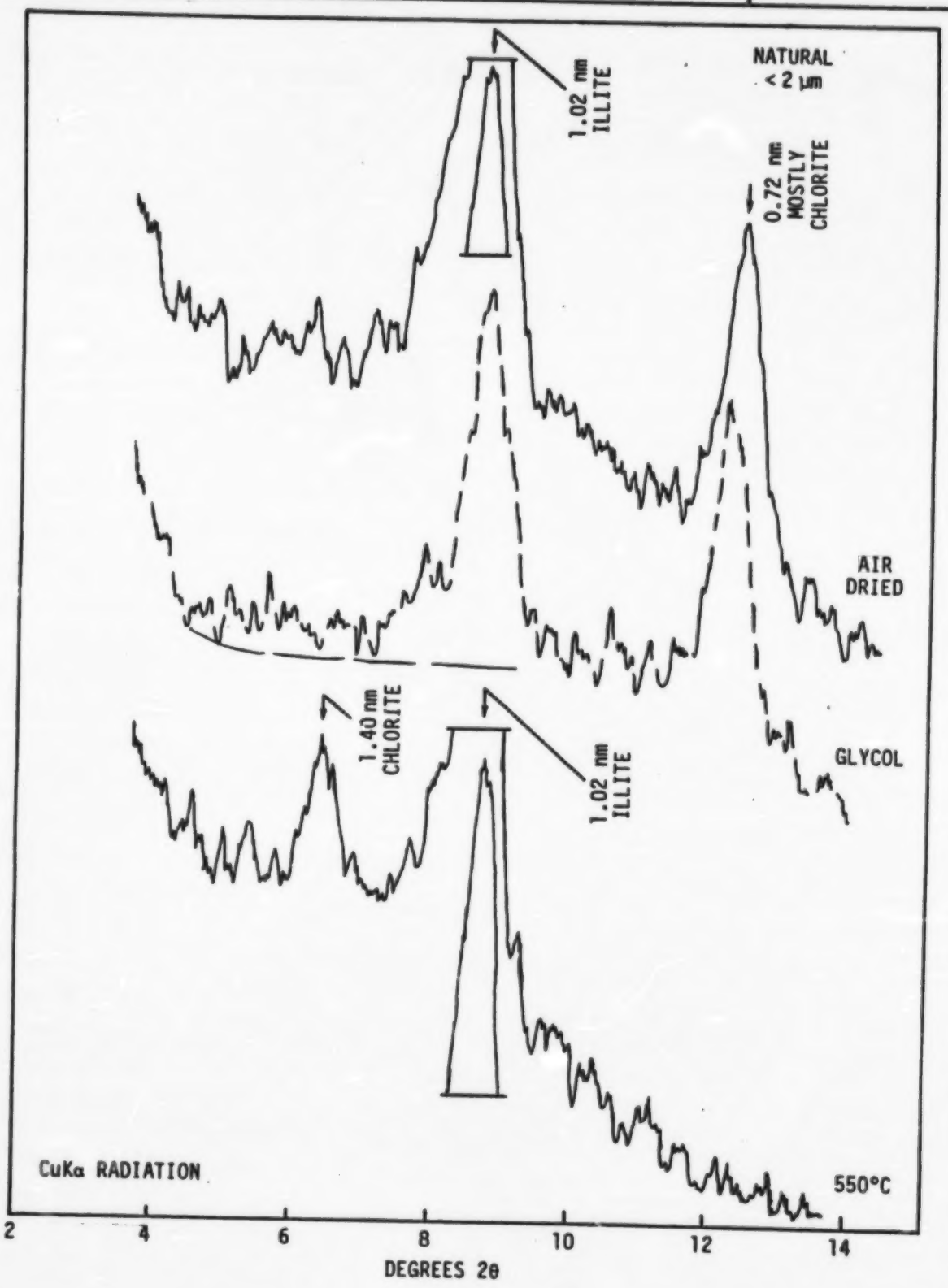
Golder Associates

Drawn G.P.
Chkd.

Form G.A.-D.-4 (M)

X-RAY TRACES OF ORIENTED, < 2 µM FINES, BH 5,
35.87 - 36.11 M, UNTREATED

FIGURE E.7(A)



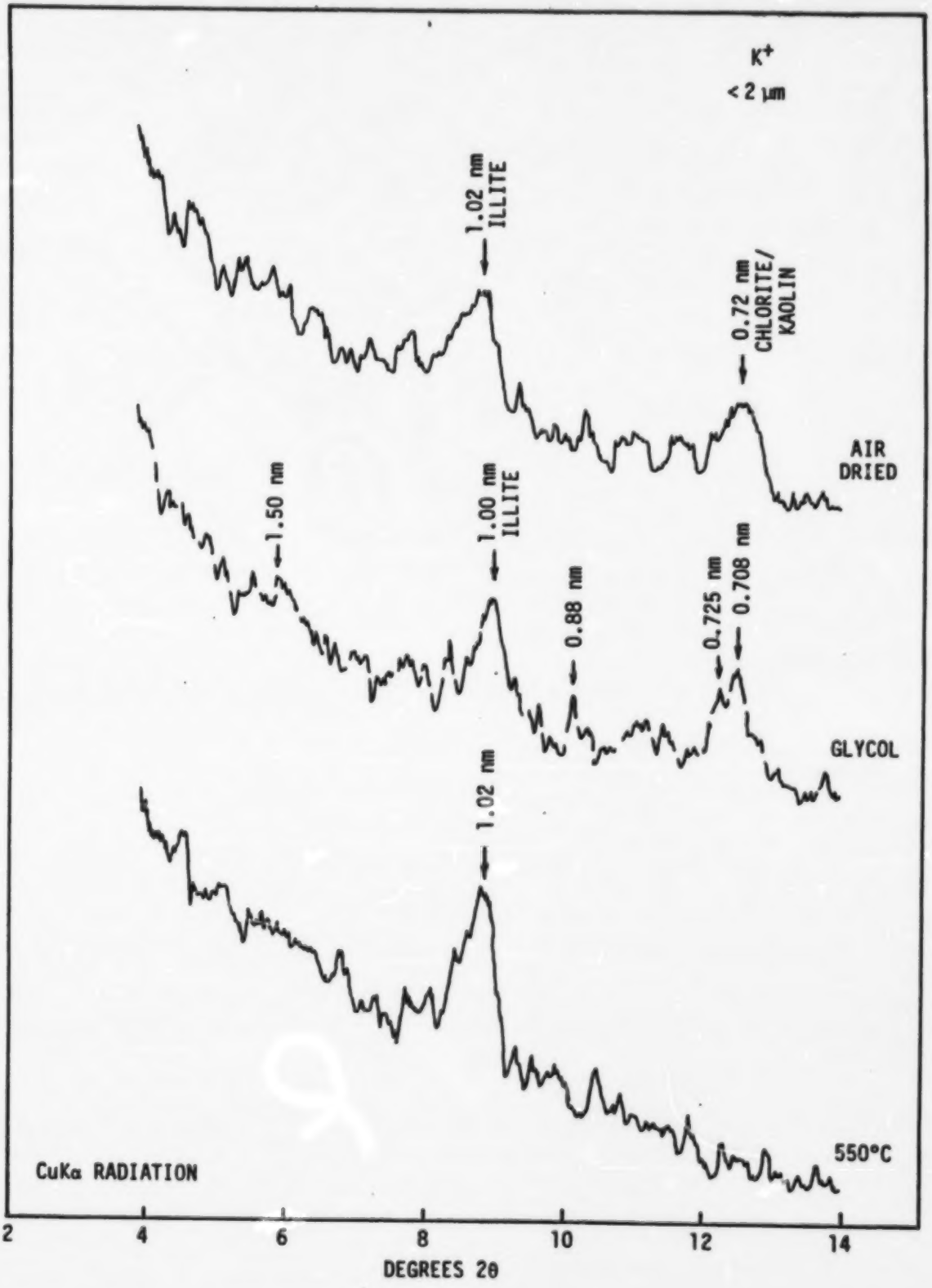
Date MAY 16,1985
Project 831-6014

Golder Associates

Drawn G.P
Chkd. SBC

X-RAY TRACES OF ORIENTED, < 2 µM FINES, BH 5,
35.87 - 36.11 M, K^+ SATURATED

FIGURE E.7(B)



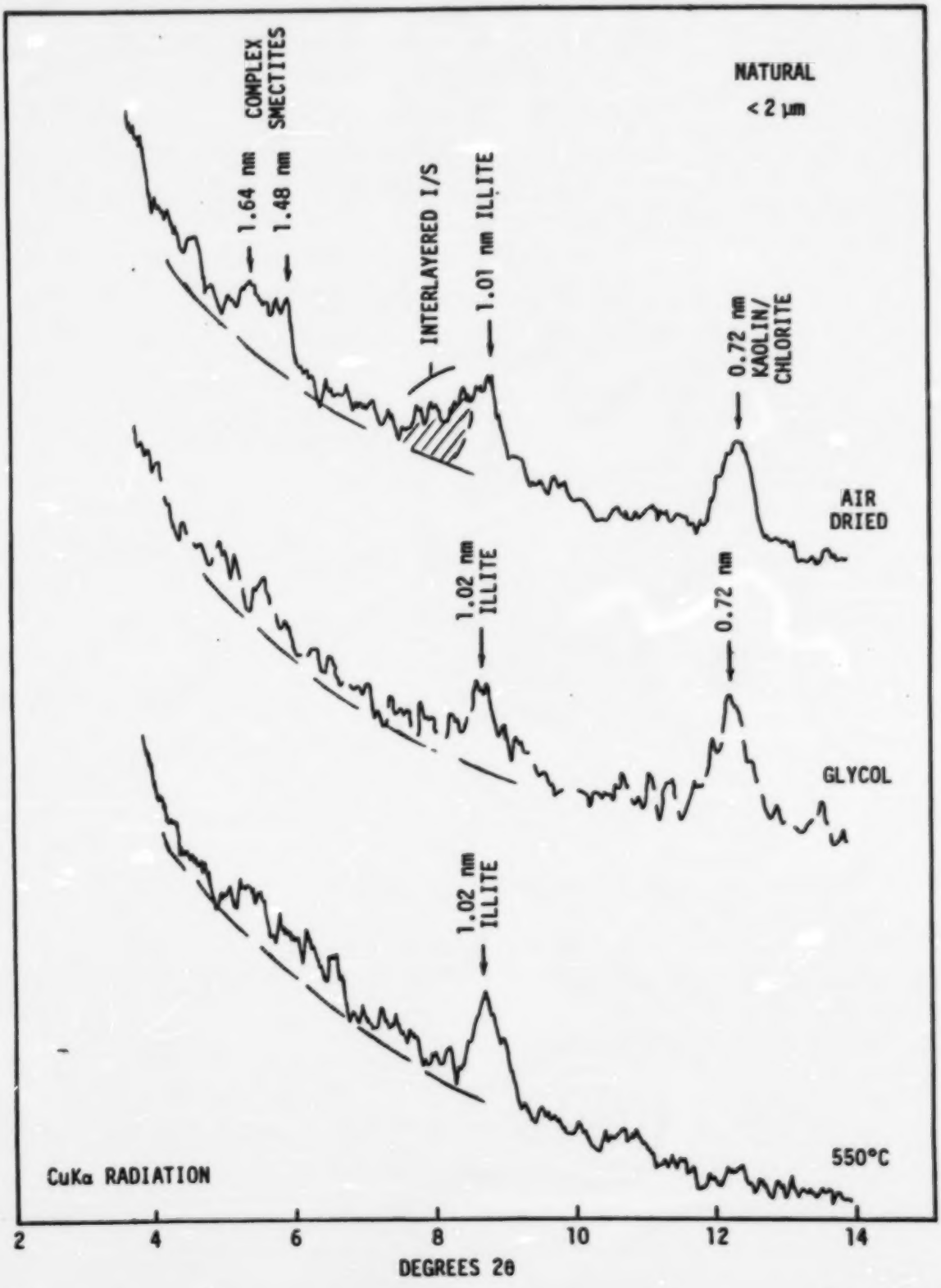
Date MAY 17,1985
Project 831-6014

Golder Associates

Drawn G.P.
Chkd. DJC

X-RAY TRACES OF ORIENTED, < 2 µM FINES, BH 7
6.36 - 6.54 M, UNTREATED

FIGURE E.8(A)



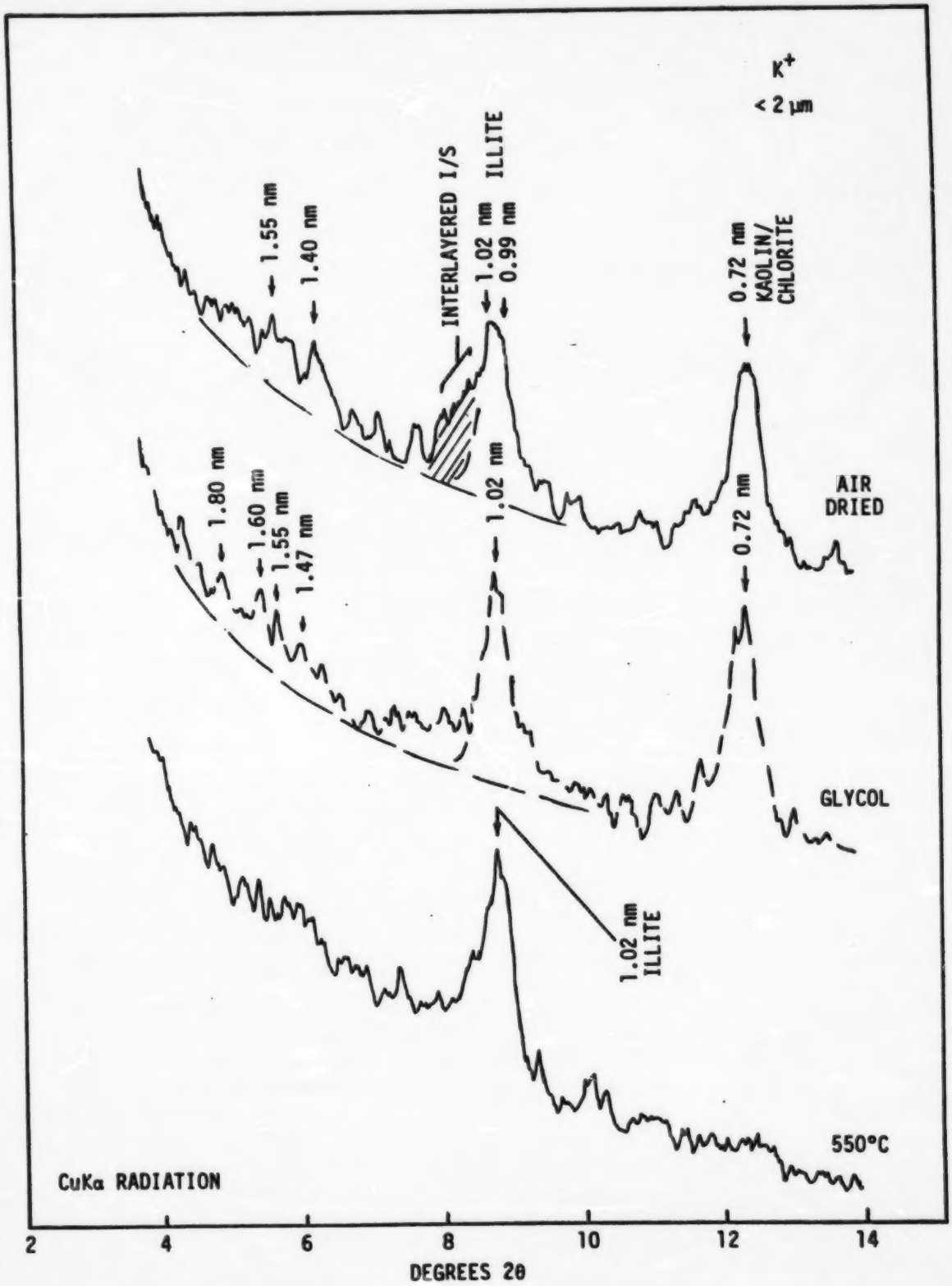
Date MAY 17, 1985
Project 851-6094

Golder Associates

Drawn G.P.
Chkd.

X-RAY TRACES OF ORIENTED, < 2 µM FINES, BH 7,
6.36 - 6.54 M, K^+ SATURATED

FIGURE E.8(B)



Date MAY 17 1985
Project 831-6014

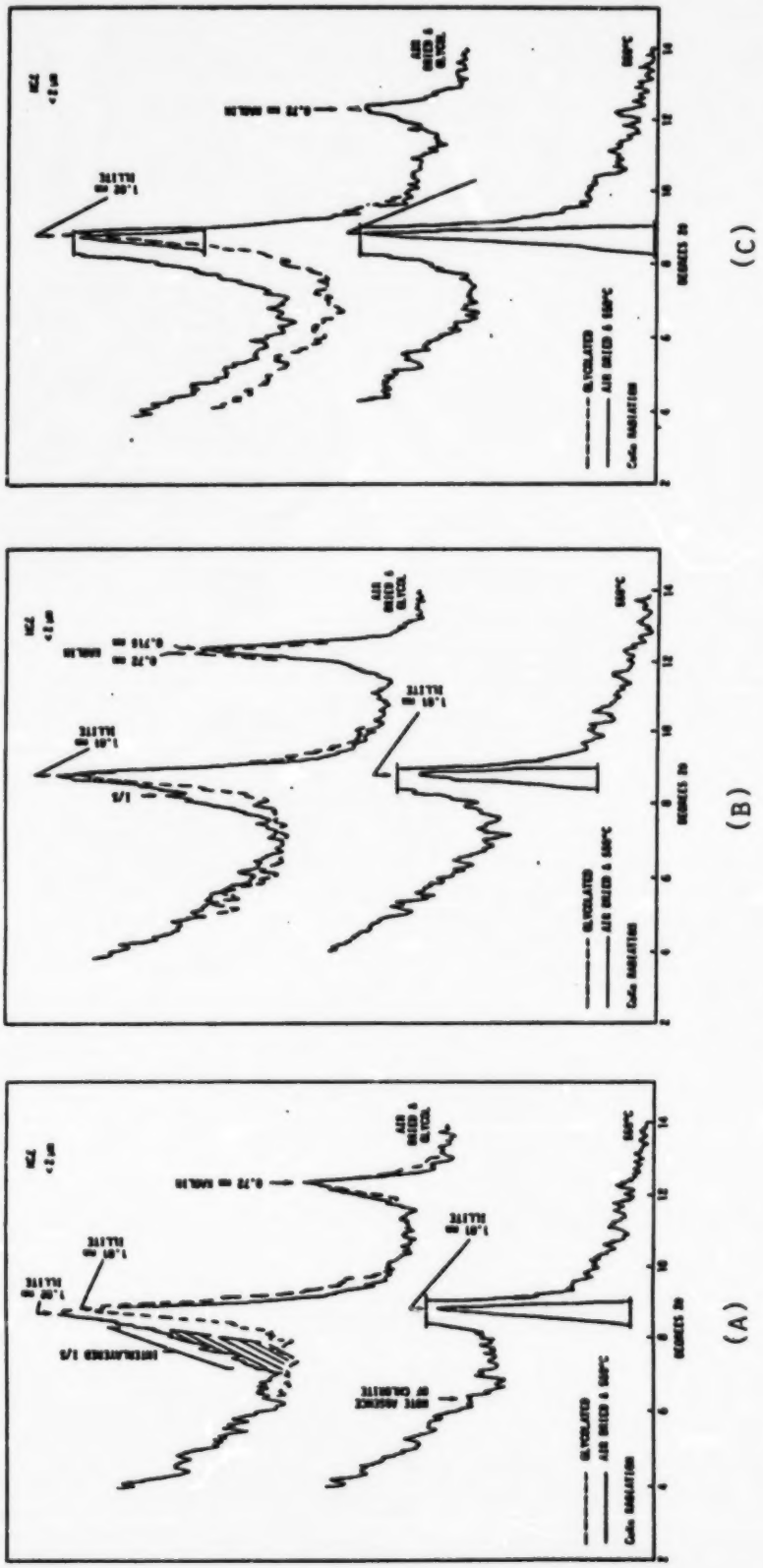
Golder Associates

Drawn S.P.
Chkd. [illegible]

Form G.A.-D.-4 (M)

X-RAY TRACES OF HCℓ TREATED, ORIENTED, < 2 μm FINES, BH 3 (13.81-13.97m) BH 5 (32.91-33.14m) AND BH 5 (35.87-36.11 m)

FIGURE E.9(A) (B)&(C)



Date MAY 17, 1985

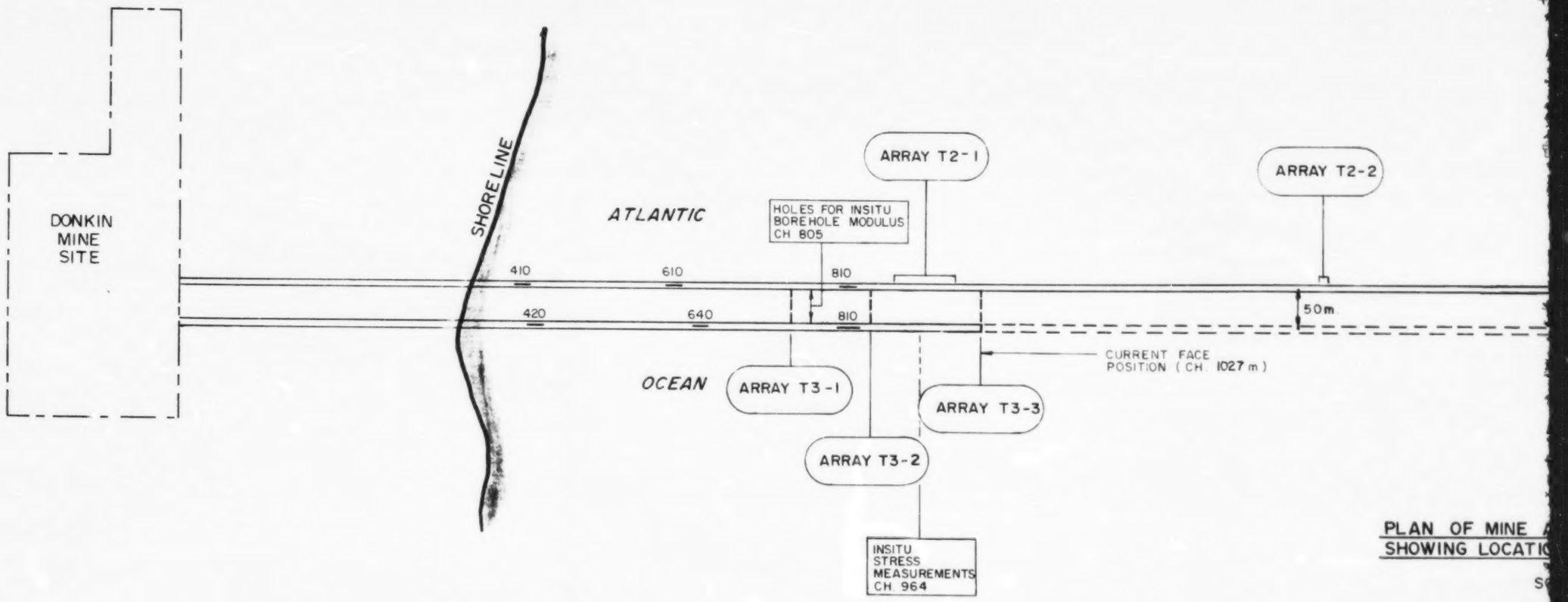
Project 831-6014

Golder Associates

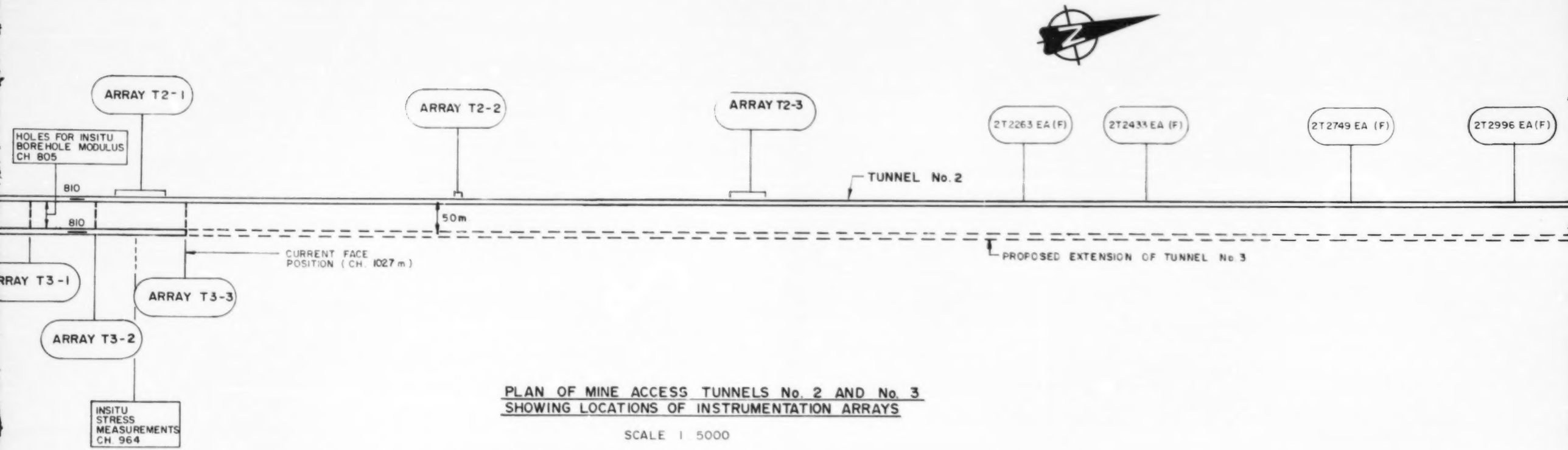
Drawn G.P.

Chkd. DKS

Form G.A.-D.-4 (M)

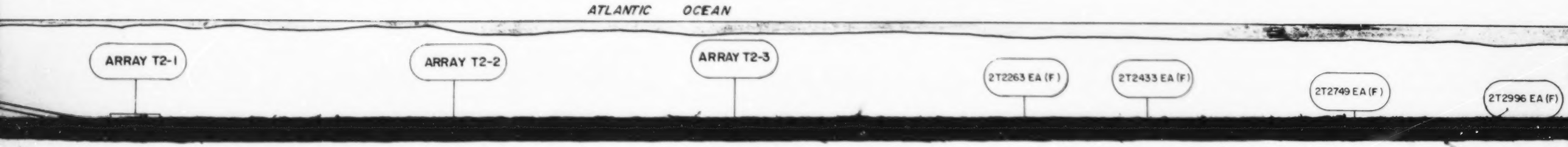


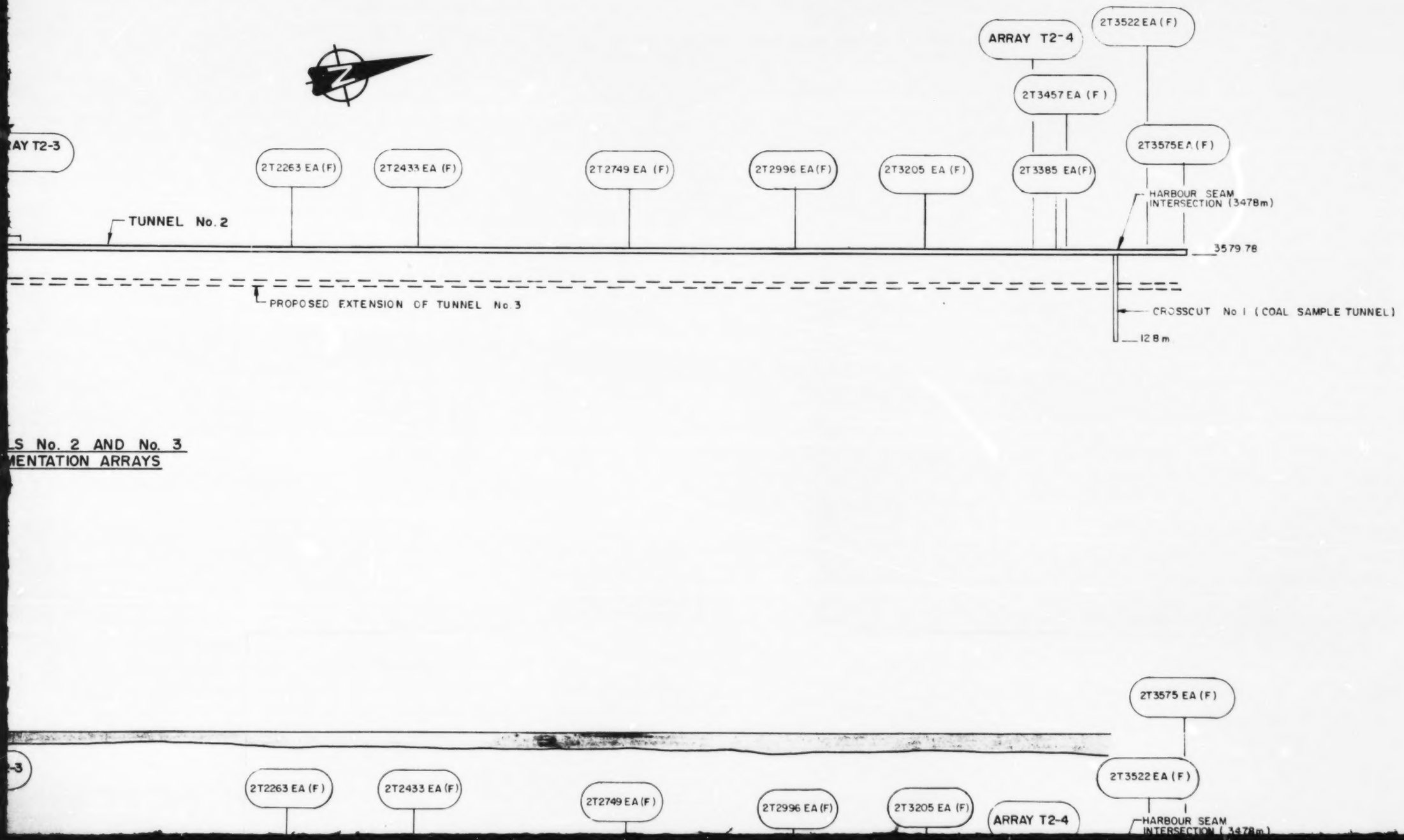
PLAN OF MINE A
SHOWING LOCATIO
SC



PLAN OF MINE ACCESS TUNNELS No. 2 AND No. 3
SHOWING LOCATIONS OF INSTRUMENTATION ARRAYS

SCALE 1 5000





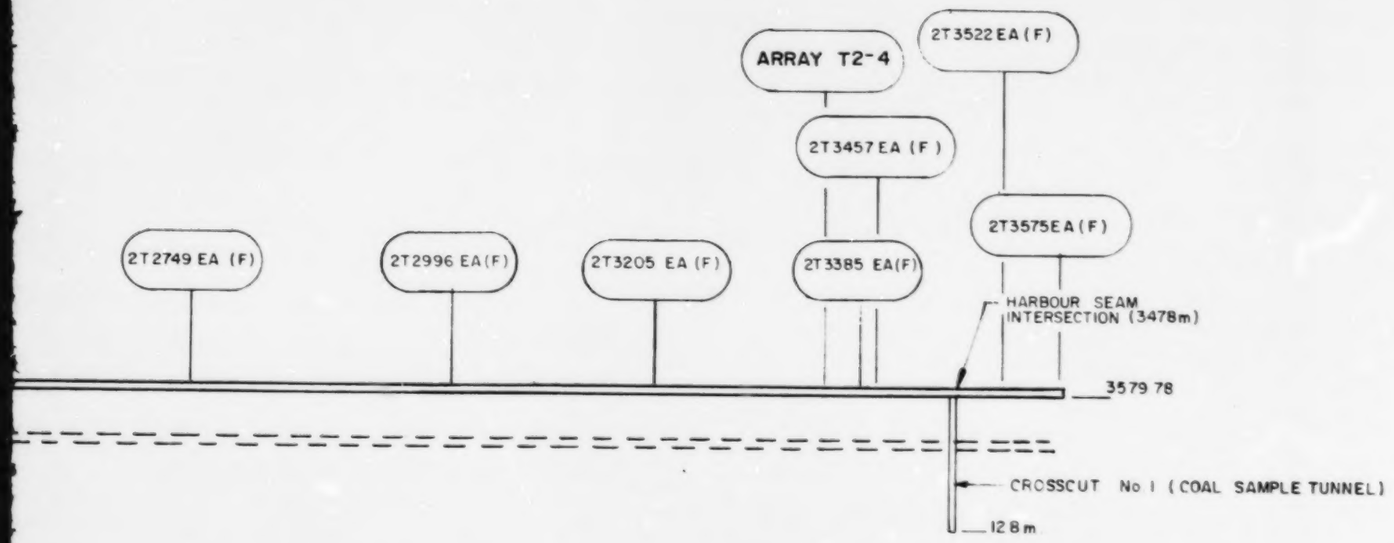
S No. 2 AND No. 3
MENTATION ARRAYS

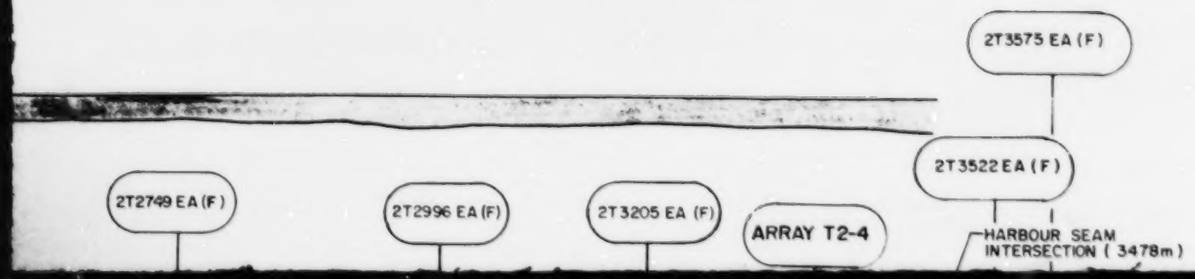
LEGEND

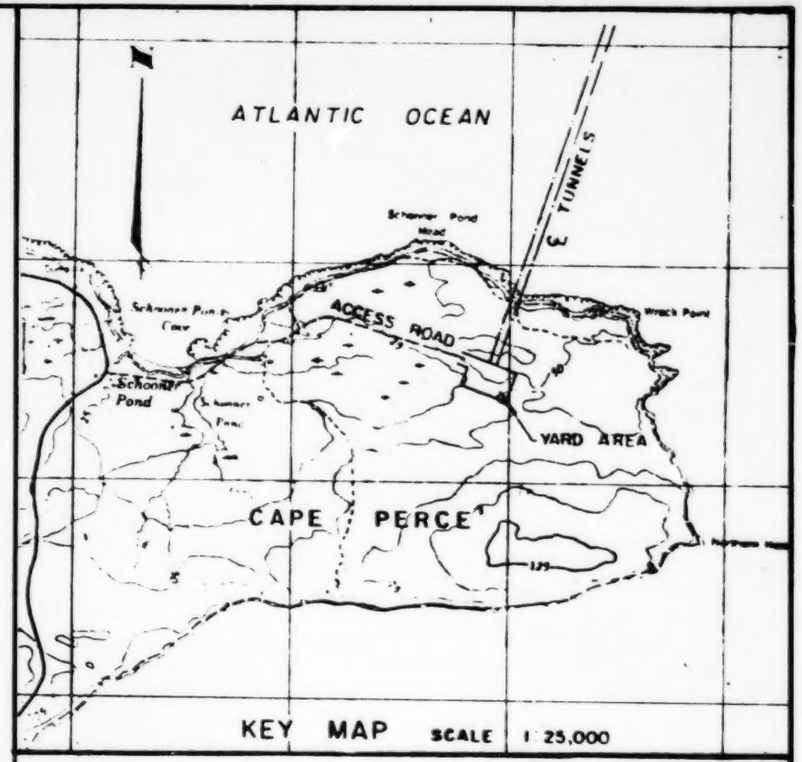
SS1A - SS

T1

T1A, T1B







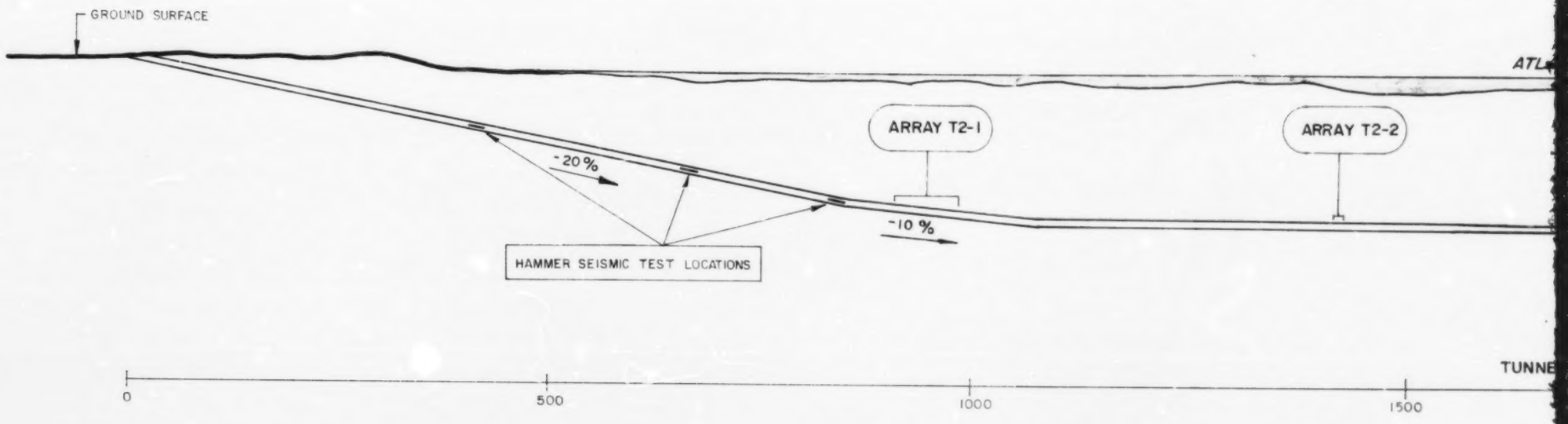
LEGEND

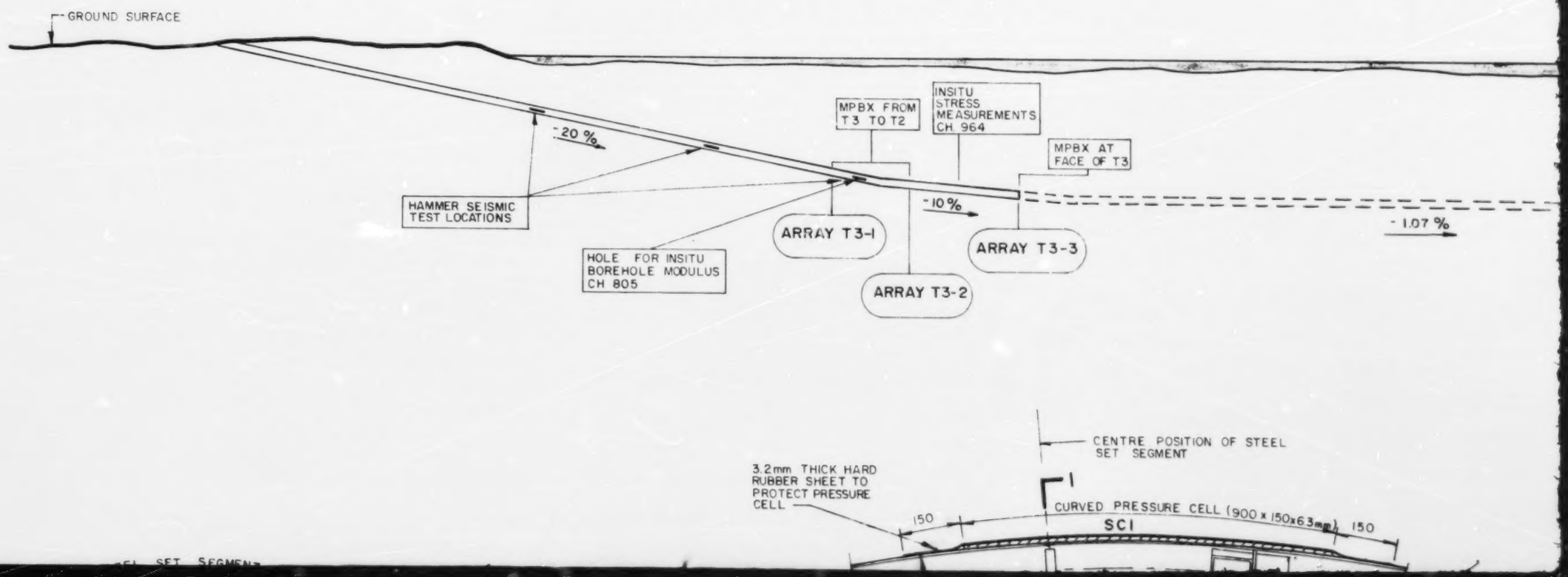
STEEL SET SEGMENT NO. 1

SS1A - SS1D - VW STRAIN GAUGES (MODEL SM2W) ON THE WEB OF STEEL SET SEGMENT NO. 1

T1 - THRUST BLOCK NO. 1 CORRESPONDS APPROXIMATELY TO THE POSITION OF RAM NO. 1

T1A, T1B - VW STRAIN GAUGES (MODEL SM2W) ON THE TOP AND BOTTOM RESPECTIVELY


GROUND SURFACE
ATL
ARRAY T2-1
ARRAY T2-2
-20%
-10%
HAMMER SEISMIC TEST LOCATIONS
TUNNE
0
500
1000
1500


GROUND SURFACE
-20%
MPBX FROM T3 TO T2
INSITU STRESS MEASUREMENTS CH 964
MPBX AT FACE OF T3
-10%
-1.07%
HAMMER SEISMIC TEST LOCATIONS
HOLE FOR INSITU BOREHOLE MODULUS CH 805
ARRAY T3-1
ARRAY T3-2
ARRAY T3-3
CENTRE POSITION OF STEEL SET SEGMENT
3.2mm THICK HARD RUBBER SHEET TO PROTECT PRESSURE CELL
150
CURVED PRESSURE CELL (900 x 150x63mm)
SC1
150

ATLANTIC OCEAN

ARRAY T2-1

ARRAY T2-2

ARRAY T2-3

2T2263 EA (F)

2T2433 EA (F)

2T2749

-20%

-10%

-1.07%

HAMMER SEISMIC TEST LOCATIONS

SECTION ALONG TUNNEL No. 2

SCALE 1:5000

TUNNEL CHAINAGE (m)

500 1000 1500 2000 2500

ATLANTIC OCEAN

-20%

MPBX FROM T3 TO T2

INSITU STRESS MEASUREMENTS CH 964

MPBX AT FACE OF T3

-10%

-1.07%

ARRAY T3-1

ARRAY T3-2

ARRAY T3-3

HOLE FOR INSITU BOREHOLE MODULUS CH 805

SECTION ALONG TUNNEL No. 3

SCALE 1:5000

CENTRE POSITION OF STEEL SET SEGMENT

3.2mm THICK HARD RUBBER SHEET TO PROTECT PRESSURE CELL

150

CURVED PRESSURE CELL (900 x 150 x 63mm)

150

SCI

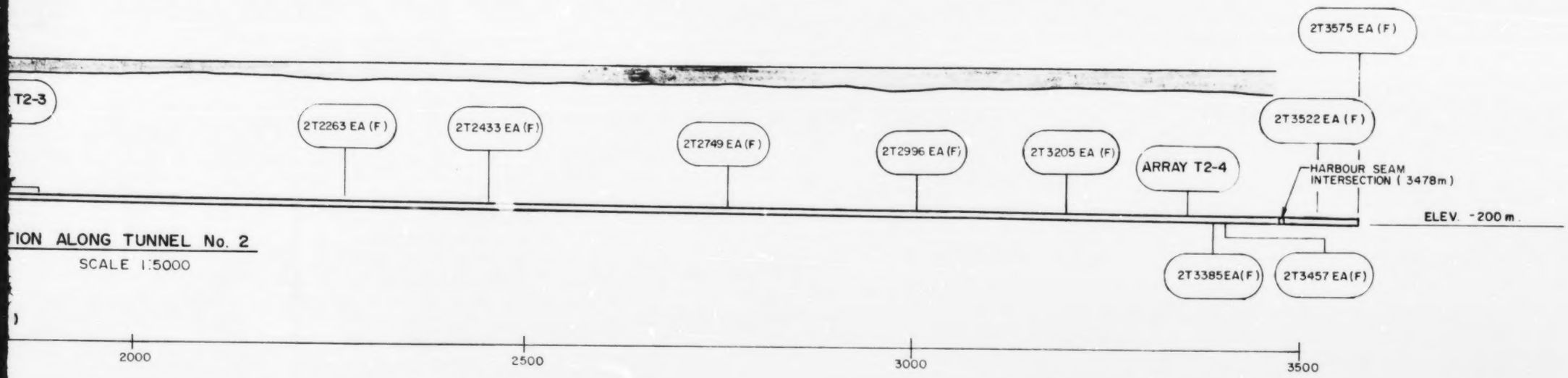
SCI

OUTBYE SIDE

6 mm FILLET WELD ALONG EDGE OF PRESSURE

3.2 mm HARD RUBBER SHEET

63 mm STAINLESS STEEL



TION ALONG TUNNEL No. 2

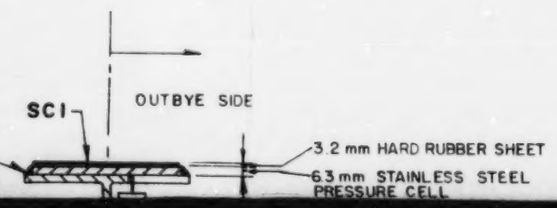
SCALE 1:5000

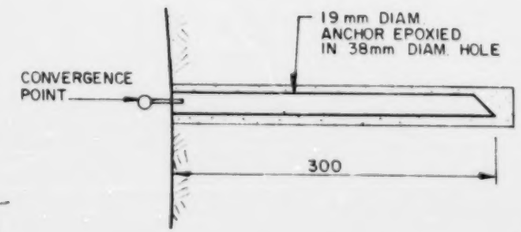
ATLANTIC OCEAN

CROSSCUT No. 1 (COAL SAMPLE TUNNEL)

NG TUNNEL No. 3

LE 1:5000





TYPICAL CONVERGENCE POINT IN ROCK

SCALE 1:5

LEGEN

SS1A - S

T1

T1A, T1B

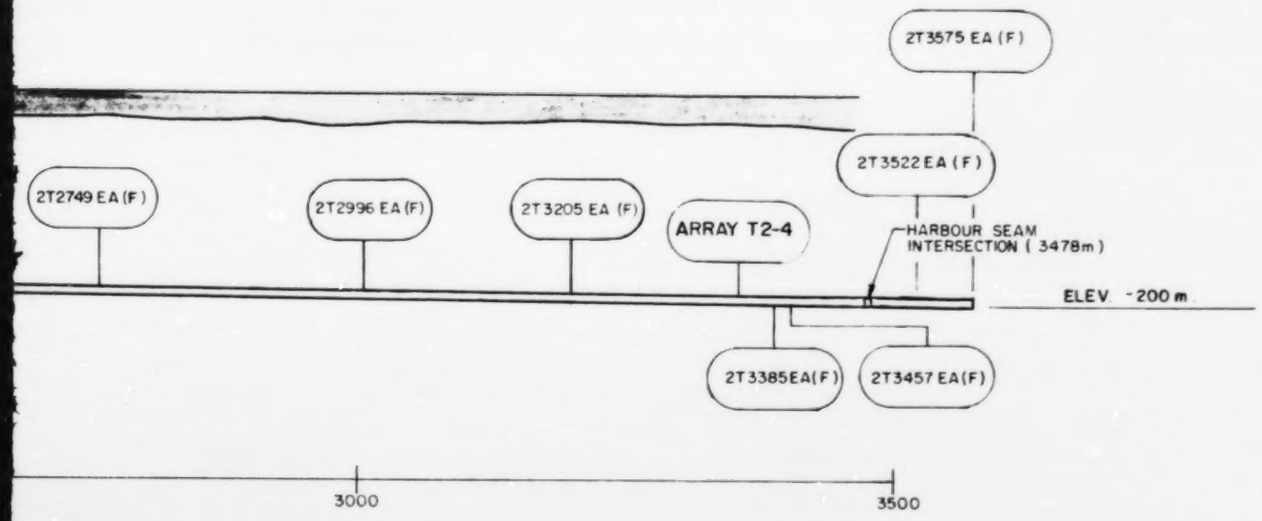
SC1 - SC

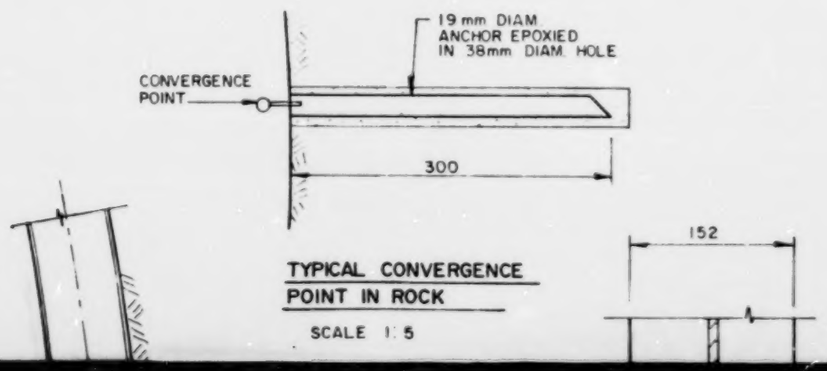
S7, S8

2T1428EA
(3,10,21

2T2996FA

NOTE: A
C





TYPICAL CONVERGENCE POINT IN ROCK

SCALE 1:5

LEGEND

STEEL SET SEGMENT NO. 1

SS1A - SS1D - VW STRAIN GAUGES (MODEL SM2W) ON THE WEB OF STEEL SET SEGMENT NO. 1

T1 - THRUST BLOCK NO. 1 CORRESPONDS APPROXIMATELY TO THE POSITION OF RAM NO. 1

T1A, T1B - VW STRAIN GAUGES (MODEL SM2W) ON THE TOP AND BOTTOM RESPECTIVELY OF THRUST BLOCK NO. 1

SC1 - SC6 - CURVED, CIRCUMFERENTIAL VW PRESSURE CELLS ON STEEL SET SEGMENTS 1 to 6

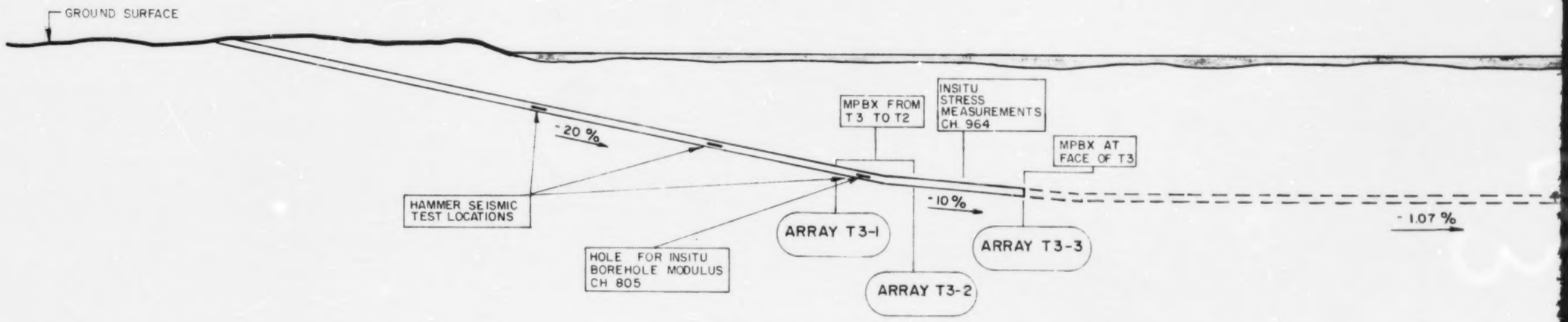
S7, S8 - AXIAL VW PRESSURE CELLS AT BUTT JOINTS AT SPRINGLINE LOCATIONS ON THE WEST AND EAST SIDES OF THE TUNNEL RESPECTIVELY

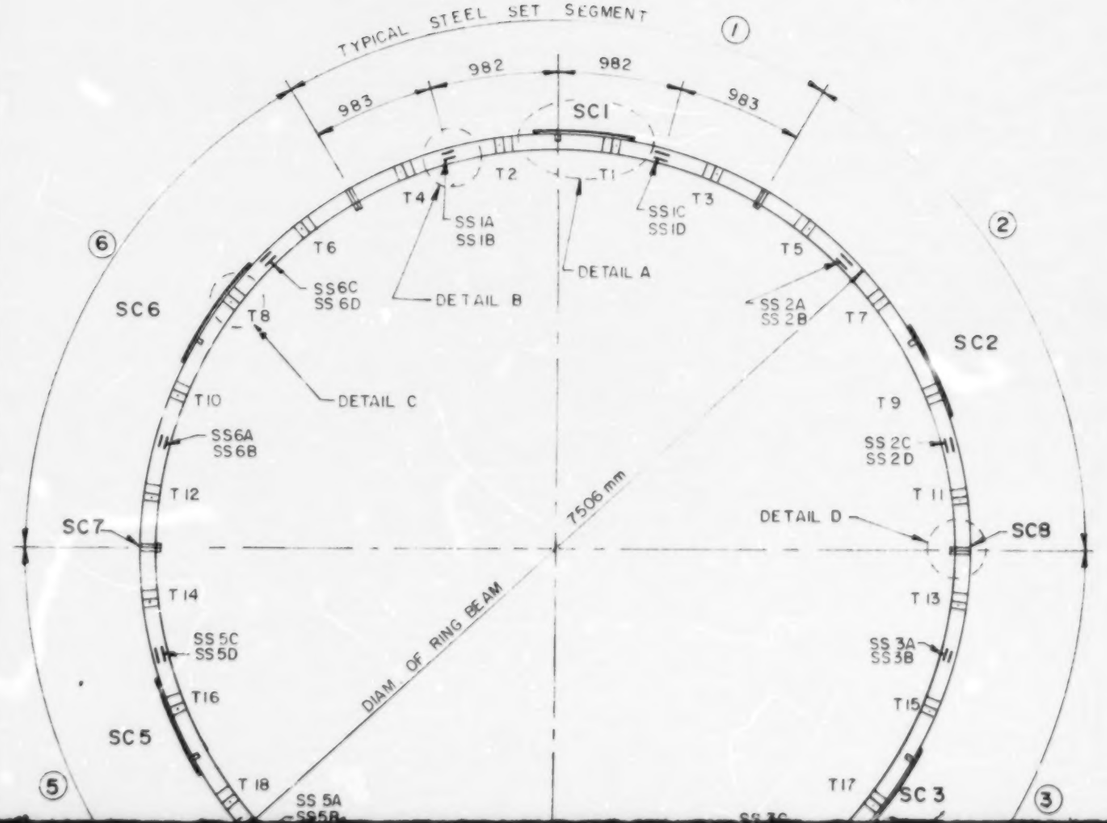
2T1428EA(R) (3,10,21) - MULTIPLE-POINT BOREHOLE EXTENSOMETERS (RIGID SONIC PROBE) IN TUNNEL 2 AT CH. 1428 m WITH ANCHORS AT 3, 10 AND 21 m POSITIONS DEFINED BY:

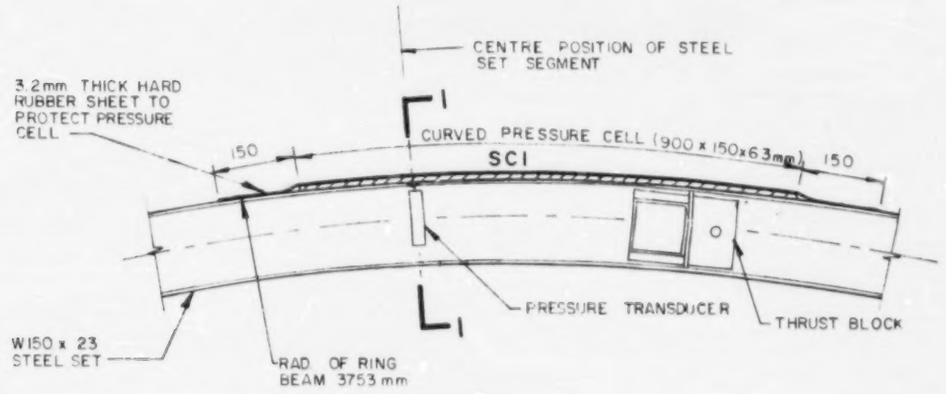
A - CROWN
B - WEST, CLOSE TO SPRINGLINE
C - EAST, CLOSE TO SPRINGLINE
D - INVERT

2T2996EA(F) - MULTIPLE-POINT BOREHOLE EXTENSOMETERS (FLEXIBLE SONIC PROBE) IN TUNNEL 2 AT CH. 2996 m WITH ANCHORS AT 0.15, 0.4, 0.8, 1.3, 1.7, 3.2, 3.7, 4.7, 5.6 AND 6.5 m.

NOTE: ALL DIEMSNIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

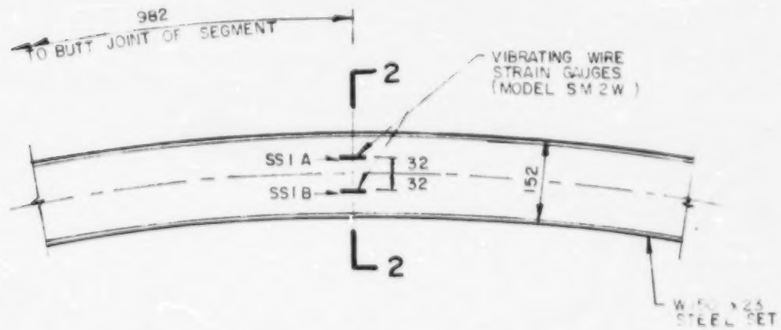






DETAIL A - TYPICAL INSTALLATION OF CURVED PRESSURE CELL

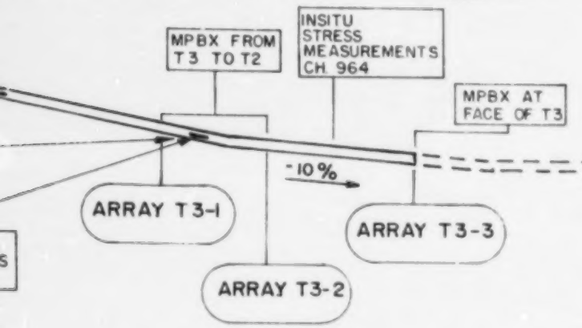
SCALE 1:10



DETAIL B - TYPICAL INSTALLATION OF VIBRATING WIRE STRAIN GAUGES ON STEEL SET

SCALE 1:10

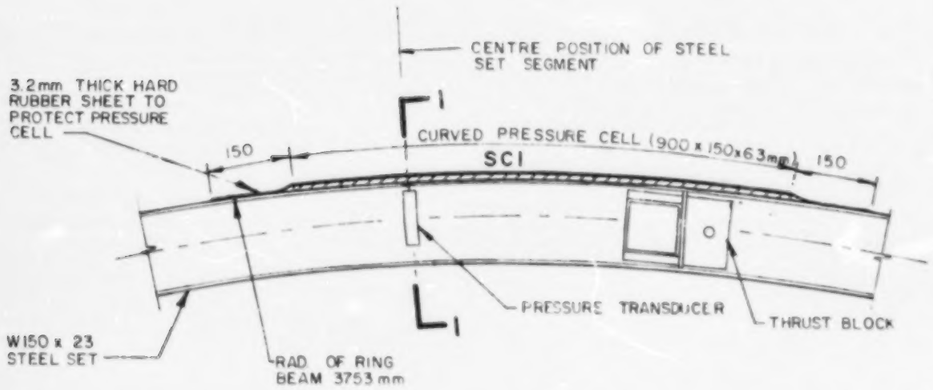
ATLANTIC OCEAN



-1.07%

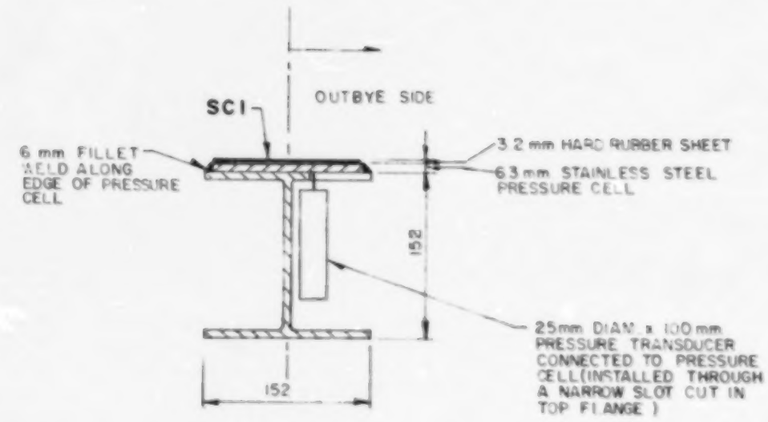
SECTION ALONG TUNNEL No. 3

SCALE 1:5000



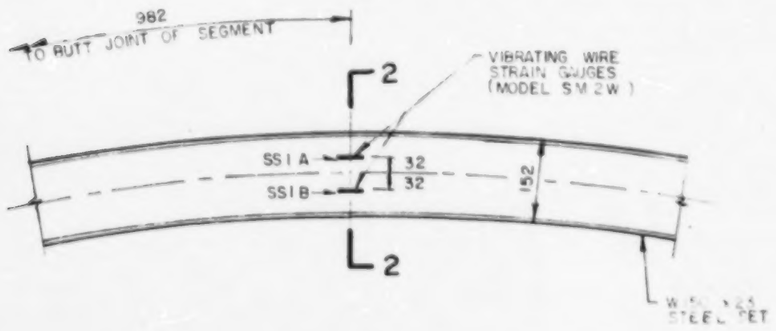
DETAIL A - TYPICAL INSTALLATION OF CURVED PRESSURE CELL

SCALE 1:10


SC1
OUTBYE SIDE
6 mm FILLET WELD ALONG EDGE OF PRESSURE CELL
3.2 mm HARD RUBBER SHEET
63 mm STAINLESS STEEL PRESSURE CELL
152
25mm DIAM x 100mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN TOP FLANGE)
152

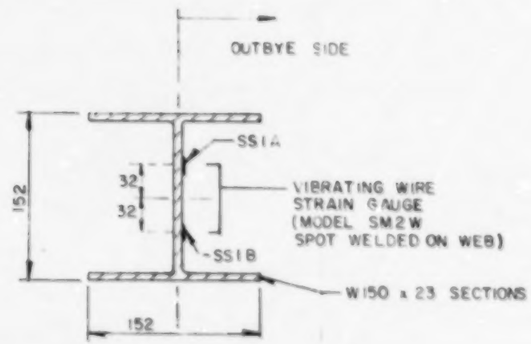
SECTION 1-1

SCALE 1:5



DETAIL B - TYPICAL INSTALLATION OF VIBRATING WIRE STRAIN GAUGES ON STEEL SET

SCALE 1:10



SECTION 2-2

SCALE 1:5

BUTT JOINT AT SPRINGLINE

SC8

CONVERGENCE POINTS BOLTED ON OUTBYE SIDE OF FLANGE AFTER RING EXPANSION

DETAIL D - TYPICAL
AT BUTT

6.5
5.6

6

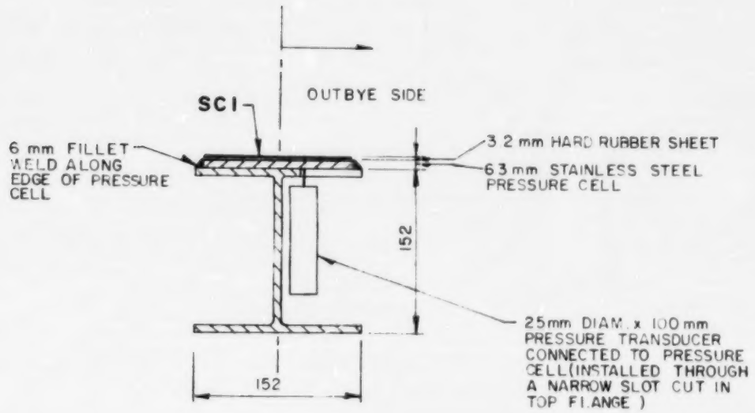
5

ATLANTIC OCEAN

CROSSCUT No 1 (COAL SAMPLE TUNNEL)

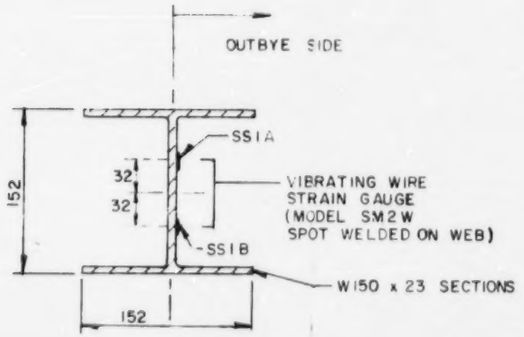
CTION ALONG TUNNEL No. 3

SCALE 1:5000


SC1
OUTBYE SIDE
6 mm FILLET WELD ALONG EDGE OF PRESSURE CELL
3.2 mm HARD RUBBER SHEET
6.3 mm STAINLESS STEEL PRESSURE CELL
152
25mm DIAM. x 100 mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN TOP FLANGE)
152

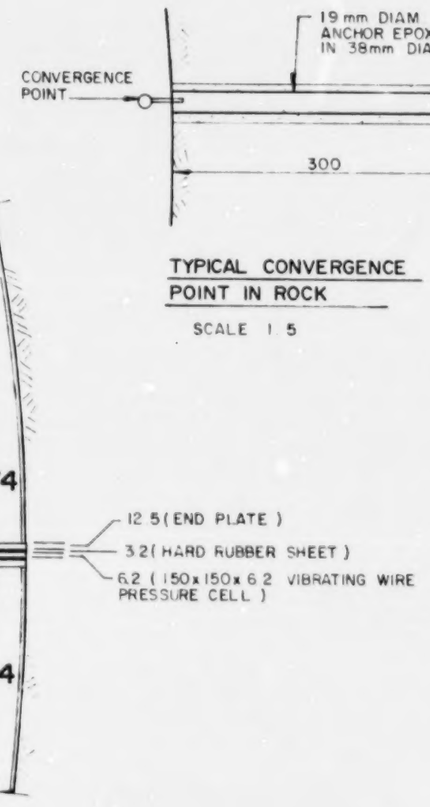
SECTION 1-1

SCALE 1:5



SECTION 2-2

SCALE 1:5

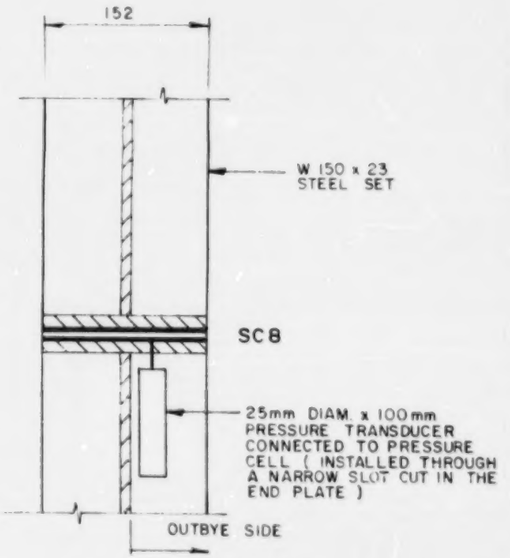


DETAIL D - TYPICAL INSTALLATION OF PRESSURE CELL AT BUTT JOINT AND CONVERGENCE POINTS

SCALE 1:10

TYPICAL CONVERGENCE POINT IN ROCK

SCALE 1:5


152
W 150 x 23 STEEL SET
SC8
25mm DIAM. x 100mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN THE END PLATE)
OUTBYE SIDE

SECTION 4-4

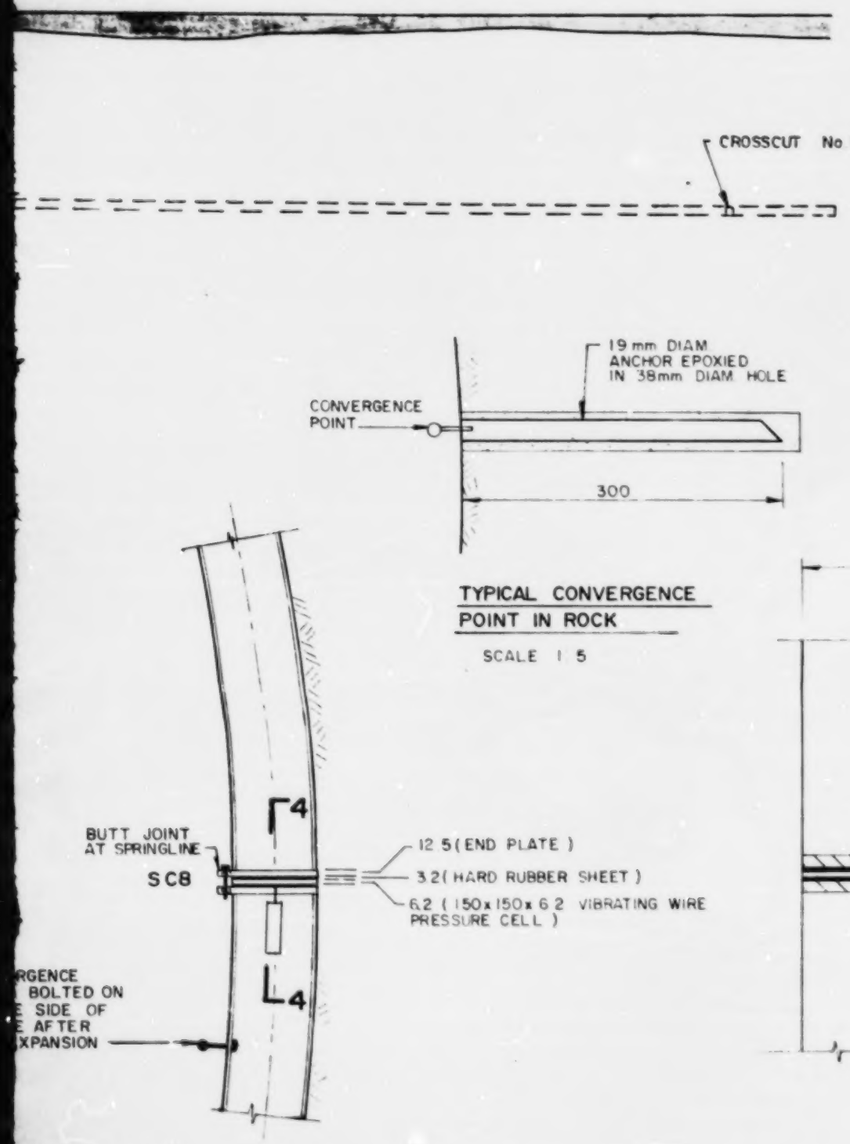
SCALE 1:5

6.5
5.6
4.7

5

6

STRATA IDENTIFICATION

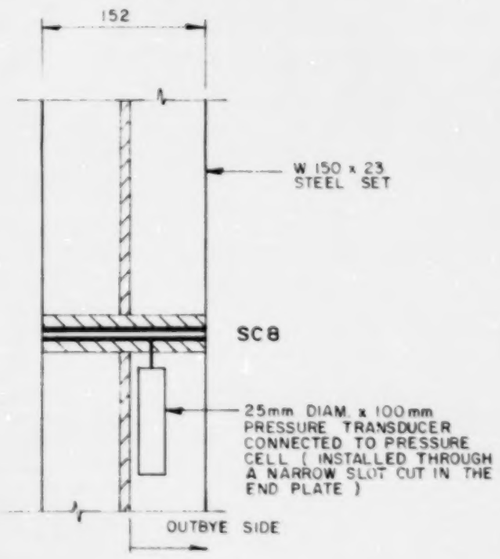


TYPICAL CONVERGENCE POINT IN ROCK

SCALE 1:5

D - TYPICAL INSTALLATION OF PRESSURE CELL AT BUTT JOINT AND CONVERGENCE POINTS

SCALE 1:10


152
W 150 x 23 STEEL SET
SC8
25mm DIAM. x 100mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN THE END PLATE)
OUTBYE SIDE

SECTION 4-4

SCALE 1:5

BY:

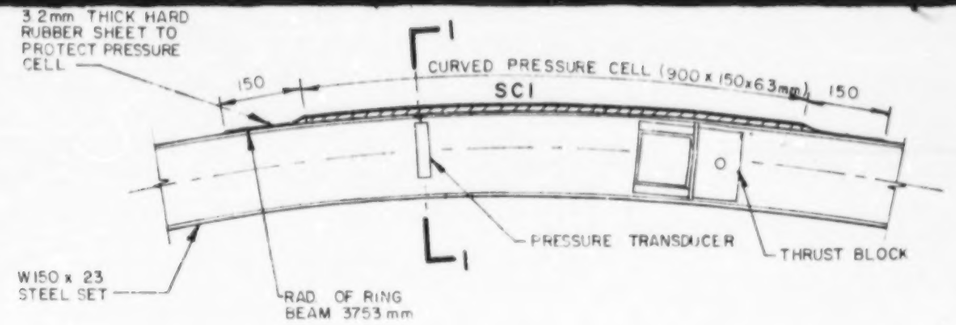
A - CROWN
B - WEST, CLOSE TO SPRINGLINE
C - EAST, CLOSE TO SPRINGLINE
D - INVERT

2T2996FA(F) - MULTIPLE-POINT BOREHOLE EXTENSOMETERS (FLEXIBLE SONIC PROBE) IN TUNNEL 2 AT CH. 2996 m WITH ANCHORS AT 0.15, 0.4, 0.8, 1.3, 1.7, 3.2, 3.7, 4.7, 5.6 AND 6.5 m.

NOTE: ALL DIEMSNIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

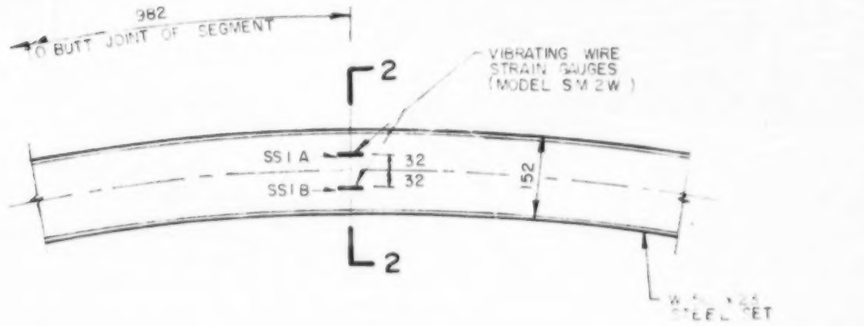
TYPICAL LAYOUT OF INSTRUMENTATION ON STEEL SET

SCALE 1:50



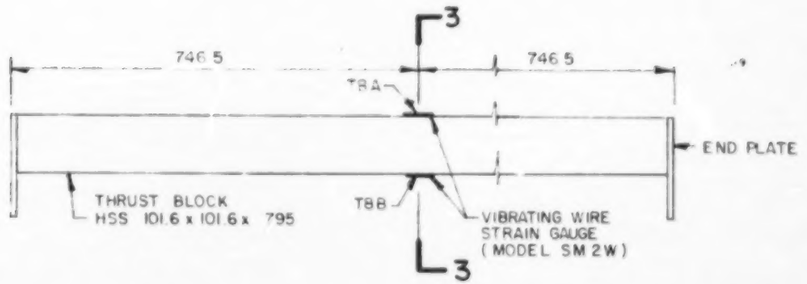
DETAIL A - TYPICAL INSTALLATION OF CURVED PRESSURE CELL

SCALE 1:10



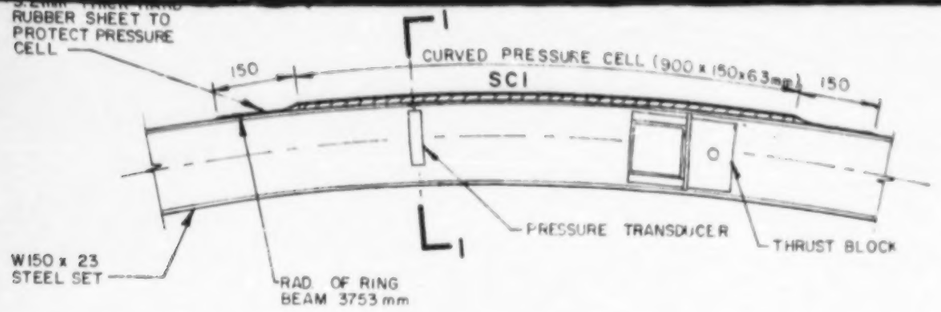
DETAIL B - TYPICAL INSTALLATION OF VIBRATING WIRE STRAIN GAUGES ON STEEL SET

SCALE 1:10



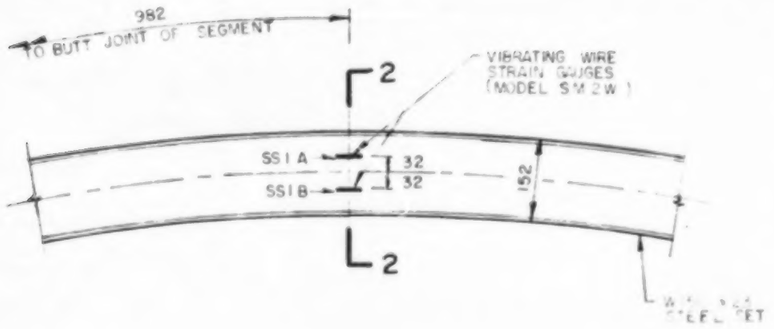
DETAIL C - TYPICAL INSTALLATION OF VIBRATING WIRE STRAIN GAUGES ON THRUST BLOCK

SCALE 1:10



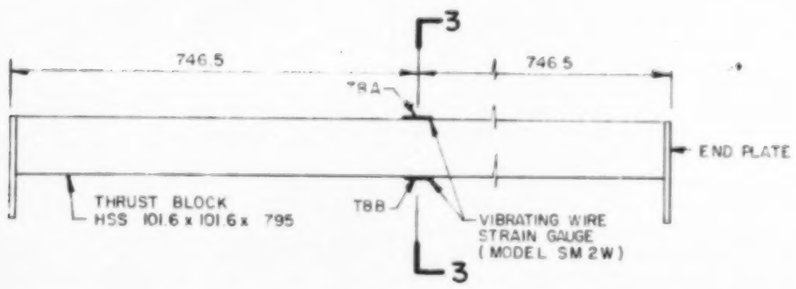
DETAIL A - TYPICAL INSTALLATION OF CURVED PRESSURE CELL

SCALE 1:10



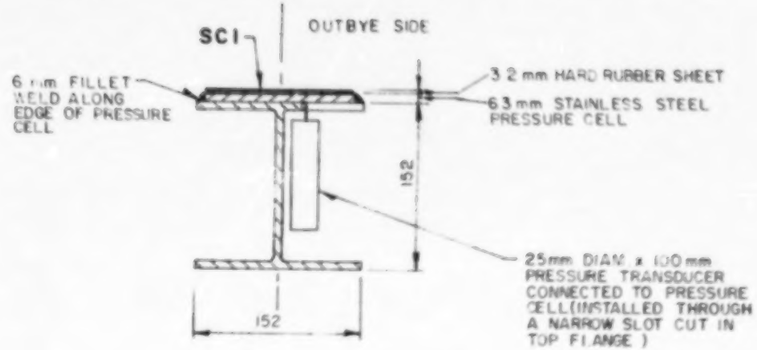
DETAIL B - TYPICAL INSTALLATION OF VIBRATING WIRE STRAIN GAUGES ON STEEL SET

SCALE 1:10



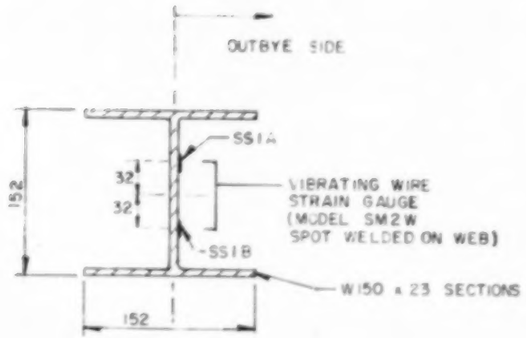
DETAIL C - TYPICAL INSTALLATION OF VIBRATING WIRE STRAIN GAUGES ON THRUST BLOCK

SCALE 1:10


SCI
OUTBYE SIDE
6 mm FILLET WELD ALONG EDGE OF PRESSURE CELL
3.2 mm HARD RUBBER SHEET
63 mm STAINLESS STEEL PRESSURE CELL
152
25mm DIAM x 100 mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN TOP FLANGE)
152

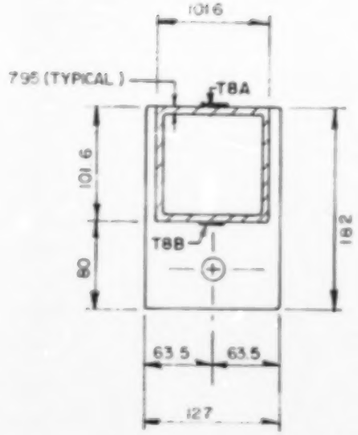
SECTION 1-1

SCALE 1:5



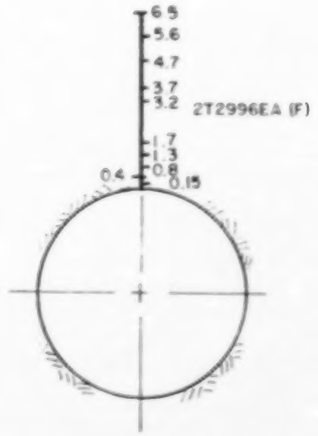
SECTION 2-2

SCALE 1:5



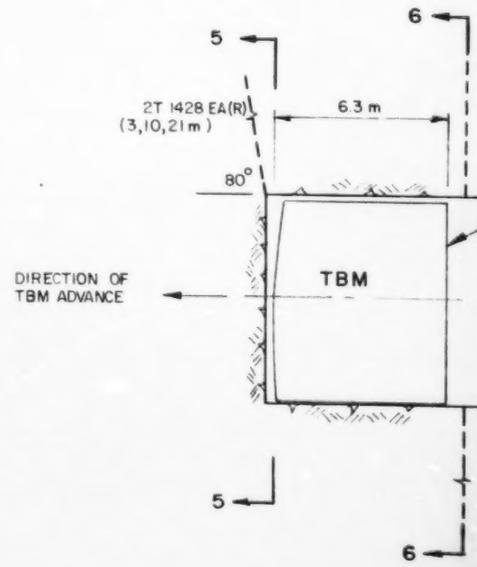
SECTION 3-3

SCALE 1:5



SECTION - TYPICAL FLEXIBLE PROBE SINGLE EXTENSOMETER ARRAYS

SCALE 1:200

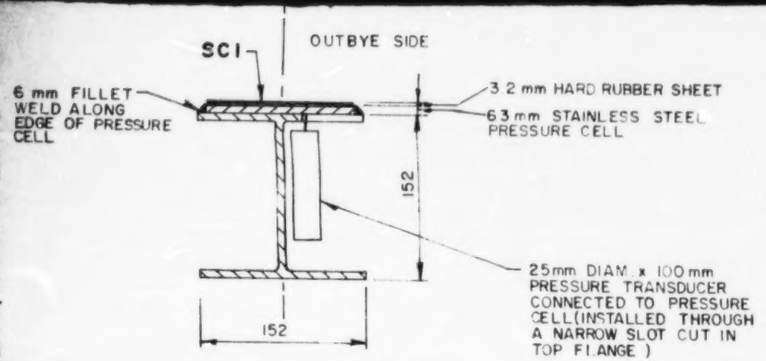


TYPICAL RIGID PROBE E
VICINITY OF

BUTT JOINT AT SPRINGLINE
SC8

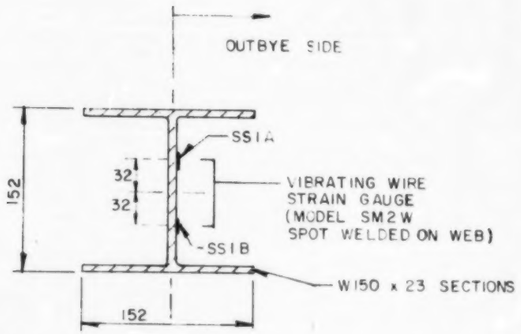
CONVERGENCE POINTS BOLTED ON OUTBYE SIDE OF FLANGE AFTER RING EXPANSION

DETAIL D - TYPICAL INS
AT BUTT J


SC1
OUTBYE SIDE
6 mm FILLET WELD ALONG EDGE OF PRESSURE CELL
3.2 mm HARD RUBBER SHEET
6.3 mm STAINLESS STEEL PRESSURE CELL
152
25mm DIAM. x 100 mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN TOP FLANGE)
152

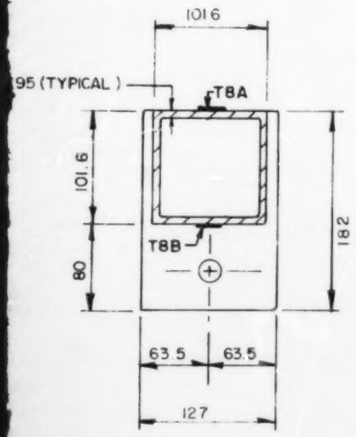
SECTION 1-1

SCALE 1:5



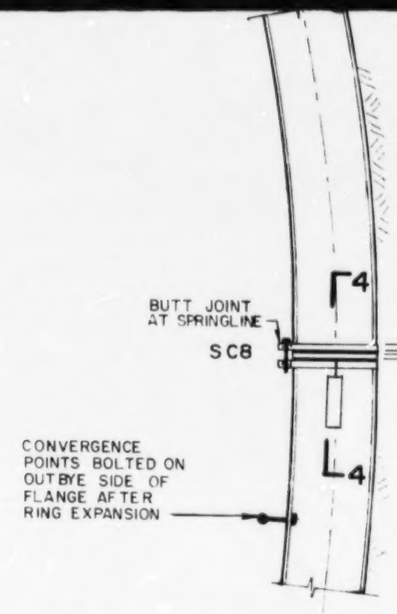
SECTION 2-2

SCALE 1:5



SECTION 3-3

SCALE 1:5

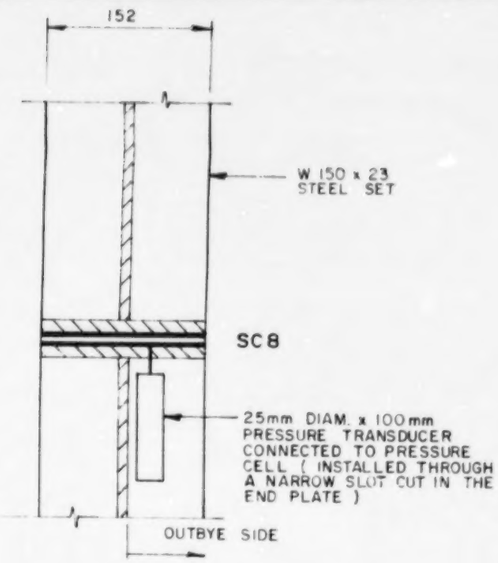


DETAIL D - TYPICAL INSTALLATION OF PRESSURE CELL AT BUTT JOINT AND CONVERGENCE POINTS

SCALE 1:10

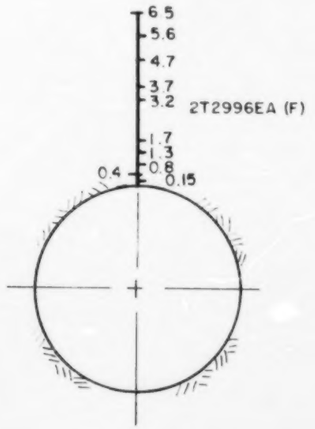
TYPICAL CONVERGENCE POINT IN ROCK

SCALE 1:5


152
W 150 x 23 STEEL SET
SC8
25mm DIAM. x 100 mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN THE END PLATE)
OUTBYE SIDE

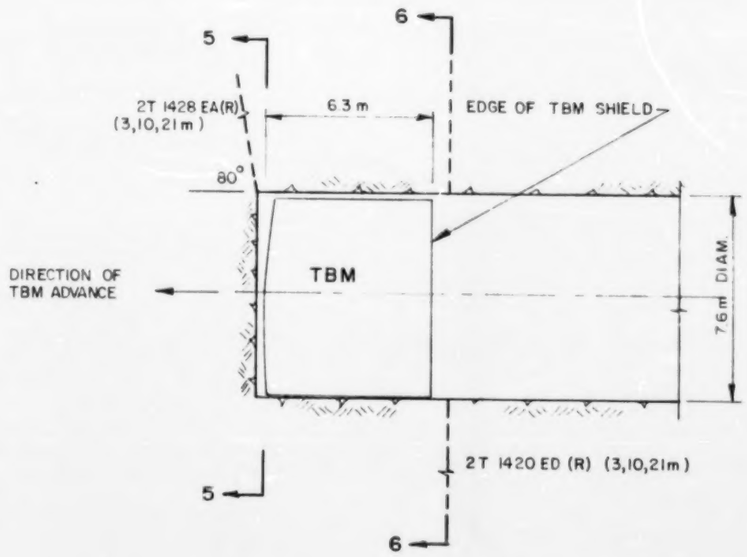
SECTION 4-4

SCALE 1:5

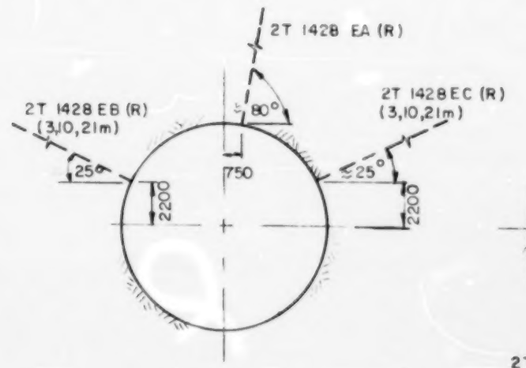


SECTION - TYPICAL FLEXIBLE PROBE SINGLE EXTENSOMETER ARRAYS

SCALE 1:200

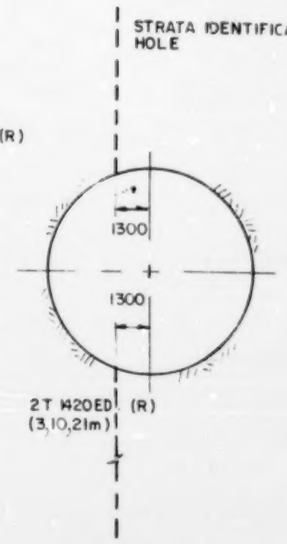


TYPICAL RIGID PROBE EXTENSOMETER IN THE VICINITY OF THE FACE SCALE 1:200



SECTION 5-5

SCALE 1:200

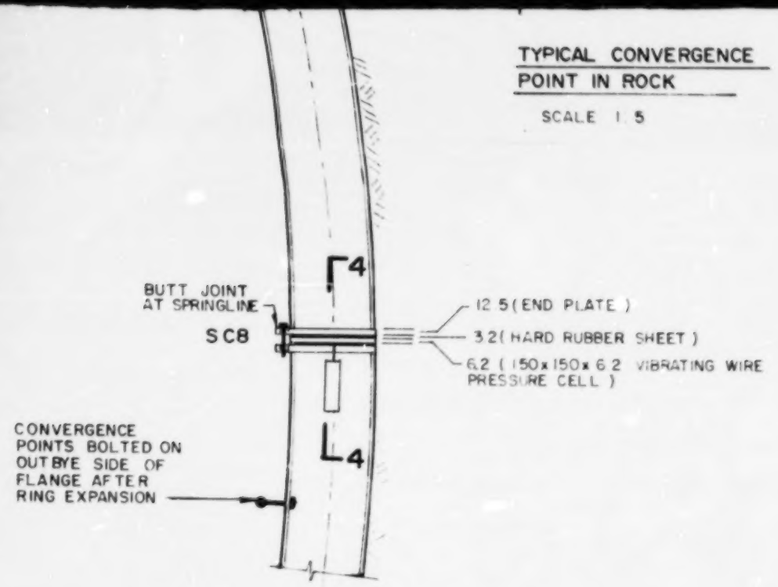


SECTION 6-6

SCALE 1:200

No.	DAT

SCALE	
DRAWN	
PROJECT N	
CHECKED	
DATE	

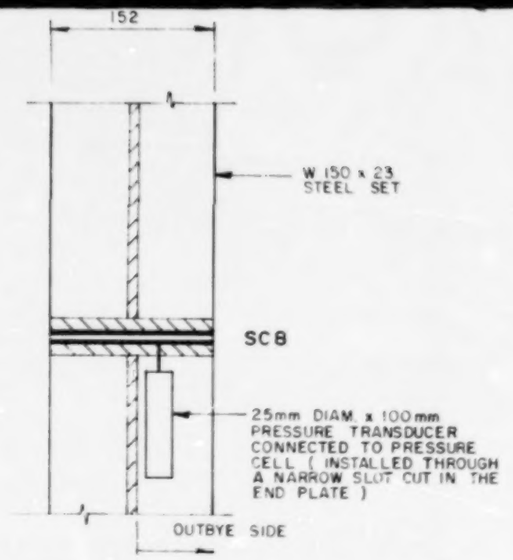


DETAIL D - TYPICAL INSTALLATION OF PRESSURE CELL AT BUTT JOINT AND CONVERGENCE POINTS

SCALE 1:10

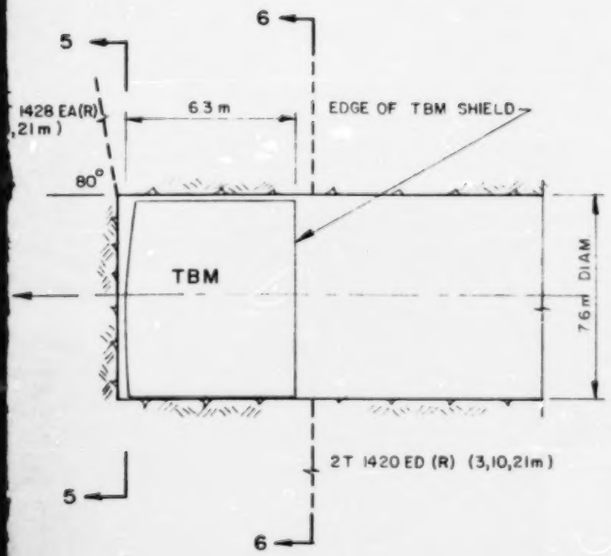
TYPICAL CONVERGENCE POINT IN ROCK

SCALE 1:5

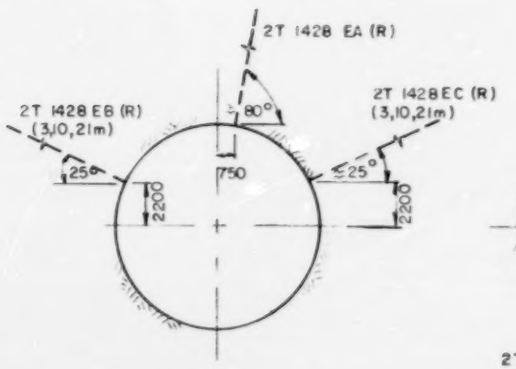

152
W 150 x 23 STEEL SET
SC8
25mm DIAM. x 100mm PRESSURE TRANSDUCER CONNECTED TO PRESSURE CELL (INSTALLED THROUGH A NARROW SLOT CUT IN THE END PLATE)
OUTBYE SIDE

SECTION 4-4

SCALE 1:5

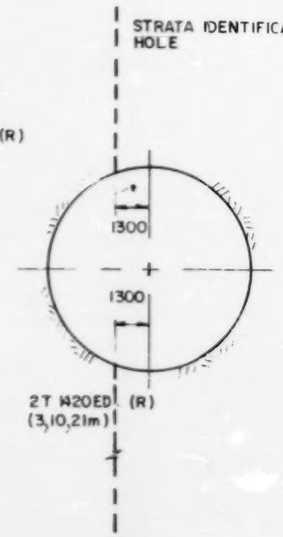


TYPICAL RIGID PROBE EXTENSOMETER IN THE VICINITY OF THE FACE SCALE 1:200



SECTION 5-5

SCALE 1:200



SECTION 6-6

SCALE 1:200

No.	DATE	REVISIONS	BY	CHKD.	ENGR.	APPR.

ROCK SUPPORT - INTERACTION STUDY
DONKIN - MORIEN PROJECT

LAYOUT OF INSTRUMENTATION IN MINE ACCESS TUNNELS

SCALE	AS SHOWN
DRAWN	G.P.
PROJECT No.	831-6014
CHECKED	
DATE	JUNE, 1985

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

FIGURE I-5.1

REV.